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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

The Results of Valvotomy for Aortic Stenosis — C. G. BAKER, F.R.C.P., MAURICE CAMPBELL, F.R.C.P. 171

Acute Mastitis — MAVIS GUNTHER, M.D. 175

Acute Barbiturate Poisoning — P. M. G. BROUGHTON, F.R.I.C., G. HIGGINS, B.SC., J. R. P. O'BRIEN, B.SC. 180

Adrenalectomy and the Metabolic Response to Injury — A. W. WILKINSON, F.R.C.S.E. 184

Acute Tubular Necrosis of the Kidney Following Abortion — Prof. G. M. BULL, F.R.C.P., A. M. JOEKES, M.R.C.P., K. G. LOWE, F.R.C.P.E. 186

Mediastinal Surgical Emphysema — P. D. O'DONOGHUE, F.R.C.S. 189

Sulphæmoglobinuria During Administration of Stibophen — A. HALAWANI, M.D., M. H. SHAKER, PH.D., A. ABDALLA, M.B., M. SAIF, M.B. 190

NEW INVENTIONS

An Instrument Rack for Casualty Surgery — GERALD OLLERENSHAW, B.M. 190

A Headlight for General Surgery — DENIS BROWNE, F.R.C.S. 191

SPECIAL ARTICLES

Present and Future Costs of the Health Service — BRIAN ABEL-SMITH, PH.D. 198

BEFORE OUR TIME

A Relic of an 18th-century Isolation Hospital — F. W. STEER, F.S.A. 200

PUBLIC HEALTH

Poliomyelitis Vaccination 200

Influenza in Suffolk 200

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 201

LEADING ARTICLES

RESTRICTION OF ANTIBIOTICS ? 193

SULPHONAMIDES AND HYPOGLYCÆMIA 193

PRECOCIOUS IMMUNITY 194

ANNOTATIONS

The Guillebaud Report 195

Antenatal Sexing 195

Polyposis of the Colon with Additional Features 196

Epidemic Kerato-conjunctivitis 196

Progress in Nucleic-acid Research 197

Printing of THE LANCET 197

LETTERS TO THE EDITOR

Domiciliary Consultation in Psychiatric Practice (Dr. Ian Skottowe) 202

Sexing Fœtuses by Examination of Amniotic Fluid (Dr. F. James) 202

Retirement Benefits for the Self-employed (Mr. E. K. Wright, F.C.A.) 203

Mental Nursing (Dr. H. C. Beecle, Dr. Morris Markowe) 203

Veno-occlusive Disease of the Liver (Dr. G. Bras) 204

Intragastric Milk Drip in Treatment of Upper Gastro-intestinal Hæmorrhage (Dr. G. N. Chandler, Dr. G. Watkinson) 204

Bread (Dr. E. P. Evans) 204

"Oedème Bleu" (Dr. Murdo Mackenzie) 205

Recruitment for the Oversea Medical Service (Dr. E. Nassau) 205

Artificial Hibernation in Heart-disease (Dr. J. Szutrely, Dr. P. V. Veghelyi) 205

Allergy to Male Sex Hormone (Dr. L. Mosonyi) 205

Opportunities in Australia (Dr. R. I. Johns) 206

Intermittent Claudication and Sympathectomy (Dr. A. J. Barnett) 206

Wound Closure with Plastic Tapes (Dr. Paul Williamson) 206

Modified Queckenstedt Test (Dr. H. J. Goldsmith) 207

"Munchausen's Syndrome" (Dr. R. S. W. Baker; Dr. F. M. Moore) 207

Sporadic Cretinism with Goitre (Mrs. Rosalind Pitt-Rivers, PH.D., F.R.S.) 207

Old Folks at Home (Mr. M. R. F. Simson) 207

Children in Hospital (Dr. I. M. Librach) 208

Tuberculosis Statistics (Dr. P. E. Baldry) 208

Personality Changes after Frontal Leucotomy (Dr. P. M. Tow) 208

Trichobezoar (Mr. H. S. Trafford, F.R.C.S.) 208

Cervical Vertigo (Dr. H. Myrhaug; Dr. S. Cope, Dr. G. M. S. Ryan) 209

Anæsthesia for Cæsarean Section (Dr. J. Shegog Ruddell) 209

Uterine Dysfunction During Labour (Dr. W. A. Cramond) 209

Effect of Colchicum Extract in Chronic Myelogenous Leukæmia (Prof. Miloš Netoušek) 210

Plagiarism ? (Dr. V. E. Lloyd Hart) 210

Hyperemesis Gravidarum (Dr. Gordon Ambrose) 210

Poliomyelitis Vaccine (Dr. R. C. Webster) 211

REVIEWS

Notices of Books 191

OBITUARY

Wilson Harold Hey 211

Arthur Felix 212

Archibald Francis Wright 213

Carl Eisinger 213

Horst Oertel 213

James Douglas Montgomery Kerr 214

Dr. H. S. Pemberton 214

Mr. E. R. Flint 214

NOTES AND NEWS

Poisons Rules 215

University of Birmingham 216

University of Liverpool 216

Diary of the Week 216

Appointments 214

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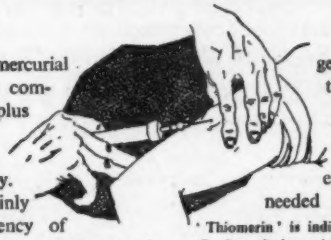

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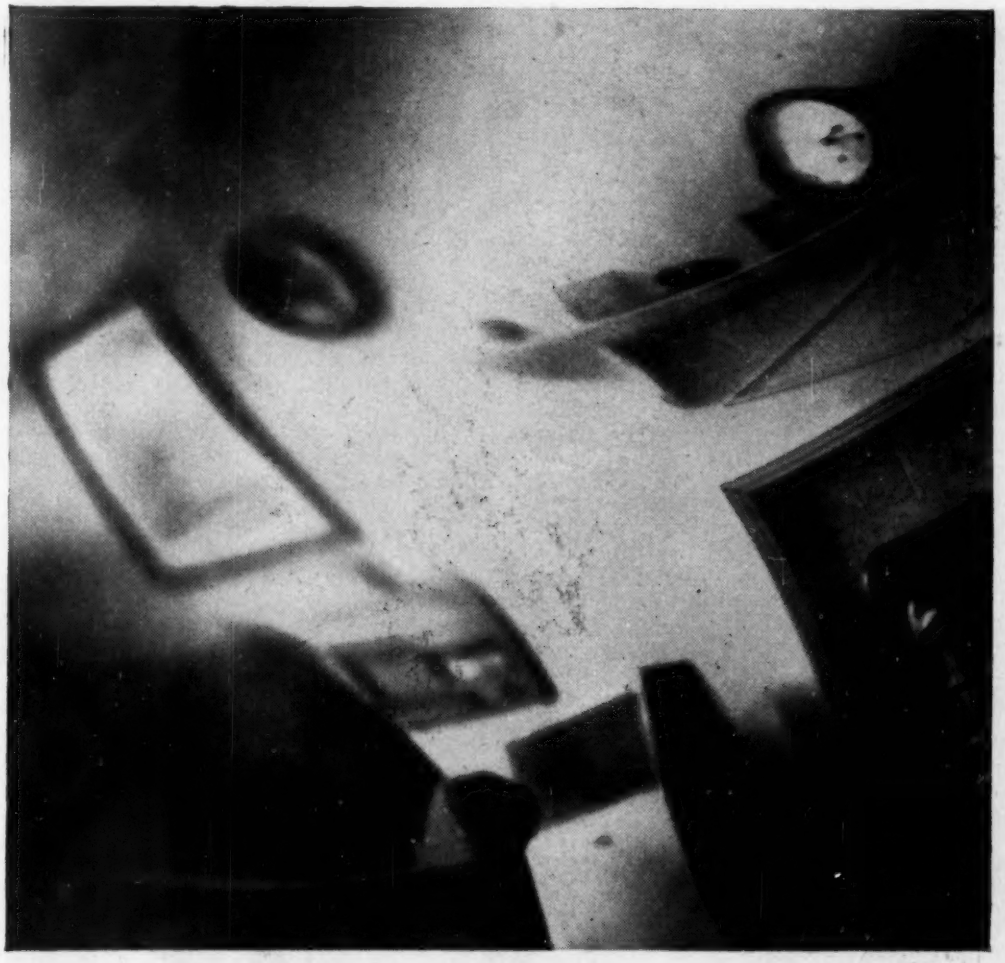

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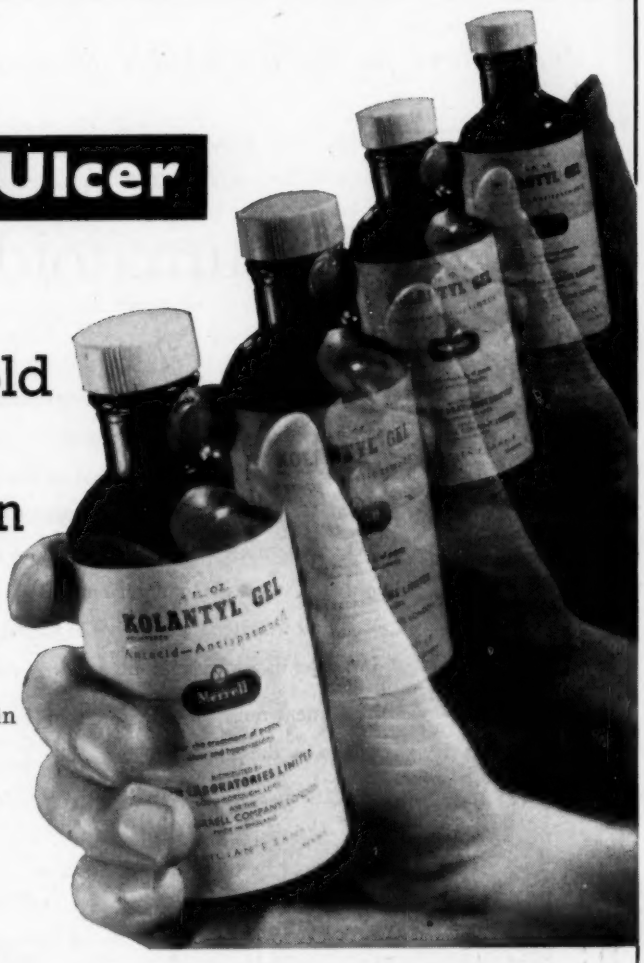

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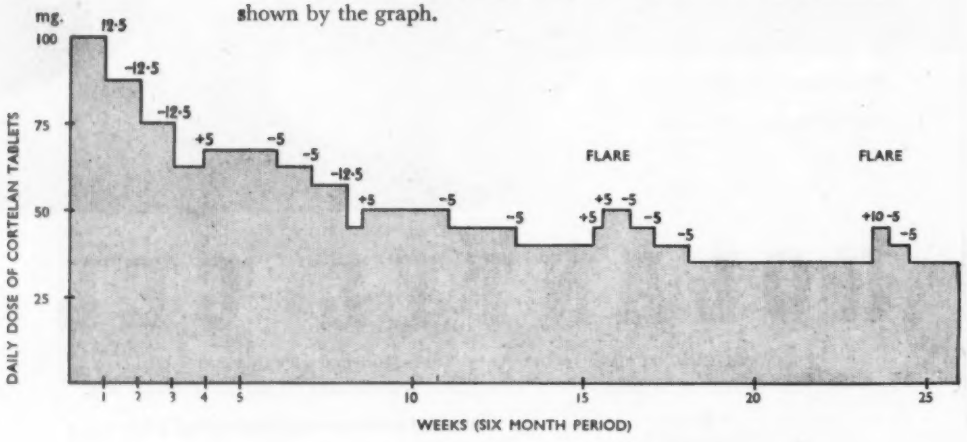

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Lancet, 1955, *ii*, 1183

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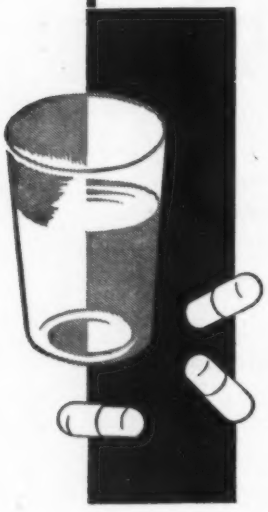

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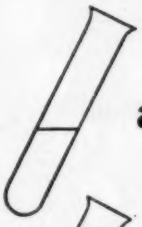

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references

1 *Z. KreislForsch.* 1954, 43, 756
2 *Angiology* 1954, 5, 314
3 *J. Pharmacy & Pharmacol.* 1952, 4, 872

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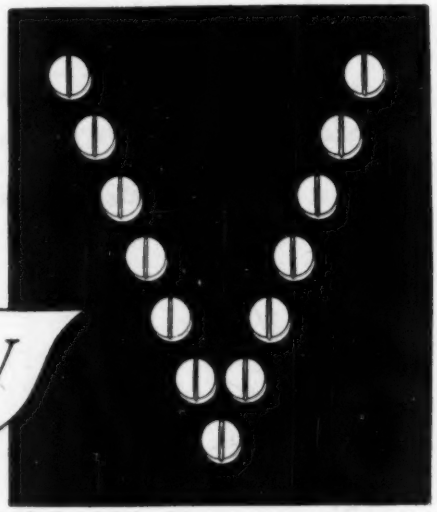

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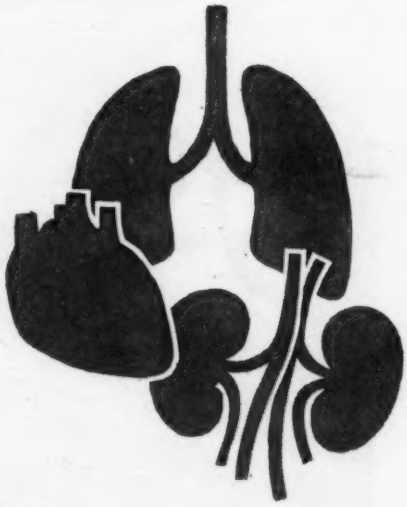

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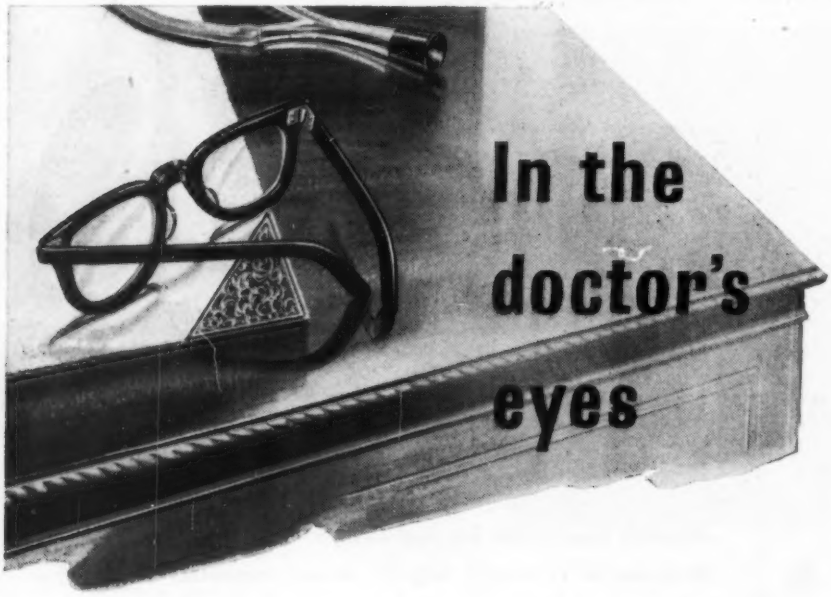

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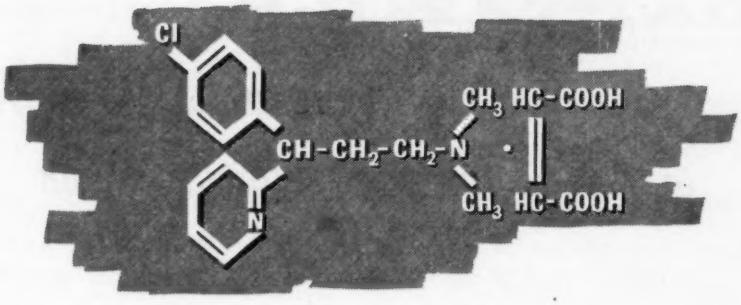

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BRIT.MED.JOURN. 1953 (JULY 25), 2.214.

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THE RESULTS OF VALVOTOMY FOR AORTIC STENOSIS

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O.B.E., M.D. Lond., F.R.C.P.
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL

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From the Cardiac Department, Guy's Hospital and the Institute of Cardiology, London

THE successful treatment of mitral and pulmonary stenosis inevitably raised the question of valvotomy for aortic stenosis. Though the object is the same—to relieve the heart muscle from the strain of working against an obstruction—it presents a more difficult problem to both surgeon and physician.

In all three conditions minor degrees of stenosis, though they give clear diagnostic signs, are well tolerated; and functional impairment of the heart and circulation is long in arriving, and may never appear. In mitral stenosis, the effect on the pulmonary circulation gives some warning and often a liberal span of time before a critical degree of stenosis threatens the patient's life. In uncomplicated pulmonary stenosis and in aortic stenosis, failure of the right and left ventricle respectively may be the first sign of danger, and by then the optimum time for surgery has past. In pulmonary stenosis, the electrocardiogram generally helps to decide the best time for operation (Campbell and Brock 1955), and the pressure gradient across the valve can be measured by cardiac catheterisation.

In aortic stenosis, the pressure gradient across the aortic valve is more difficult to obtain. We do not yet know the stage at which symptoms justify the risk of operation, nor the significance that should be attached to left ventricular strains as demonstrated by the electrocardiogram. Further, the valve itself is likely to be calcified, and this makes operation difficult and increases the risk of valvular incompetence after operation. Incompetence is not only more likely, but also more serious with aortic valve than with the pulmonary valve, because it is subjected to higher pressure. Nor can one welcome the approach through the wall of the left ventricle, which at present seems necessary.

Our purpose in reporting the results of aortic valvotomy in the first 16 of our patients who were operated on up to December, 1954, is to try to solve some of these problems and to emphasise the difficulty the surgeon faces in treating advanced aortic stenosis. Though good results can be obtained, the risk of operation and the risk of producing aortic incompetence are both high.

Condition of Patients Before Operation

We are here discussing patients with predominant aortic stenosis and not those with mitral stenosis as well. In most patients who have had operations for both conditions, the mitral stenosis has been predominant: the gradient across the aortic valve (measured at operation) has been less than in the present group with isolated aortic lesions, and the improvement after double valvotomy has been mainly due to relief of the mitral lesion. Our predominantly aortic cases presented quite a different problem.

As will be seen from table I, 12 of our 16 patients showed a similar clinical picture, though the following 4 differ in some features:

In case 8 there was more incompetence, with a blood-pressure of 120/70 mm. Hg. For this reason great hesitation was felt about operation, though it was strongly indicated by the patient's frequent anginal and syncopal attacks and was, in fact, successful for a time.

Case 7 had a very large heart and gross congestive failure.

Cases 11 and 15 were children with congenital aortic stenosis. Operation was advised because of their increasing disability and anginal pain.

Most of our patients were men between 40 and 50 years old, and the average age was 46. The onset of symptoms was less than five years before operation in all but 4 cases. On the other hand, the cardiac murmur had nearly always been noted much earlier, at an average age of 22. None of the patients, except case 8, had any evidence of rheumatic fever or of other valvular disease. We need not discuss here whether the stenosis was congenital with secondary atherosclerosis and calcification, or whether these had developed on a valve that was normal: in either case, they can be distinguished from the obvious rheumatic condition, where there is nearly always mitral stenosis and aortic incompetence.

All the patients were in normal rhythm. All had a high grade of stenosis with little or no incompetence. Those with more incompetence were excluded because this indicates that the valve is less completely stenosed and that regurgitation would probably increase if the valve were opened more widely. 8 of the 16 had a soft aortic diastolic murmur, but except in case 8 the degree of incompetence was insignificant. All had classical signs of aortic stenosis, with a rough systolic murmur and thrill in the aortic area, a strong apical thrust, and a pulse that was slow-rising and generally small. It is, however, sometimes difficult to take the

TABLE I—FINDINGS IN PATIENTS WITH AORTIC STENOSIS BEFORE VALVOTOMY

Case no.	Sex	Age (yr.) When murmur first heard	Age (yr.) Onset of serious symptoms	Age (yr.) At time of operation	Syncopal attacks	Angina	Heart-failure	Cardio-thoracic ratio (%)	Aortic 2nd sound	Aortic diastolic murmur	Degree of calcification of aortic valve (radioscopy)	Blood-pressure (mm.Hg)	Leads in which T waves were inverted
1	M	27*	57	61	Many	+ +	LV	50	Absent	—	+ +	105/80	I–III, V4–V6
2	M	17*	49	51	Few	+	LV	48	Normal	+	+ +	102/67	I, II, V5, V6
3	M	10	42	48	Some	+ +	RV	54	Diminished	—	+ +	105/85	I, V5, V6
4	M	11	48	50	None	—	RV	53	,,	—	+	102/85	I, V5, V6
5	M	32*	38	40	None	+ + +	LV	52	,,	+	+ +	98/68	I, II, V4–V6
6	M	19	41	43	None	+ + + +	..	53	Absent	—	+	95/70	I, II, V3–V6
7	M	?	38	46	None	—	RV	66	Diminished	—	+ +	100/85	..
8	F	20	38	40	Many	+ +	LV	45	,,	+	+	120/70	I, II, V4–V6
9	F	21	40	48	Few	+ +	LV	61	,,	—	+ +	122/100	I–III, V4–V6
10	M	28*	36	38	Few	+ +	..	49	Normal	+	+ +	102/77	I, II, V5, V6
11	M	2	4	6	None	+ +	..	59	Diminished	—	—	95/65	I, II, V4–V6
12	M	33	35	40	Few	+ +	..	47	Normal	+	+ +	110/80	I–III, V5, V6
13	F	? 1	29	40	Many	+ + +	..	50	,,	—	+	115/90	I–III, V3–V6
14	M	23	33	37	Many	+ +	..	51	,,	+	+ +	140/100	I–III, V5, V6
15	F	4	7	10	Once	+ +	..	55	Diminished	+	—	95/70	I–III, V3–V6
16	M	49	49	51	Few	—	LV	50	,,	+	+ +	115/85	I, V3–V6

* These murmurs were noted while they were in the Army. LV = Left ventricular. RV = Right ventricular.

blood-pressure accurately in patients with aortic-valve disease, and the pulse-pressure, which averaged 27 mm. Hg (109/82), is apparently not always a reliable measure of the degree of aortic stenosis. The second heart-sound was normal in 5, diminished in 9, and not heard in 2 cases on auscultation in the aortic area, though probably it could have been found by phonocardiography: we do not think it is a helpful sign in the diagnosis or in the assessment of the severity of aortic stenosis.

The heart was little if at all enlarged, the cardiothoracic ratio averaging 51·5% and being between 47% and 55% in all but cases 7, 9, and 11. Large hearts were uncommon, mainly because there were no patients with much aortic incompetence; but this did not exclude concentric hypertrophy of the left ventricle, which was found in the patients who died. Some prominence of the left ventricle was seen on radioscopy, even in the smaller hearts, and there was some prominence of the first part of the aorta in most of the cases with congenital lesions. Calcification of the aortic valves was seen in all the patients except the 2 children.

The electrocardiogram always showed severe left-ventricular strain and deep T-wave inversion in leads I, V5, and V6, and often in leads II and V4 as well, except in case 7 in which there was right bundle-branch block.

It was the symptoms that decided us to advise surgery in these 16 patients. 11 had syncopal attacks and 5 had them very frequently; 13 had anginal pain and this was often the main reason for their incapacity. All had dyspnœa and several had cardiac asthma, showing that the left ventricle was failing; and 2 developed congestive failure after the decision to operate but before their admission to hospital. The time between the onset of significant symptoms and operation was not very long, and in those cases where there was delay it was generally a rapid increase of symptoms that led us to advise operation.

Results of Operation

All these patients were operated on by Sir Russell Brock, to whom we should like to express our thanks. Before discussing the results, the first patient will be described. Although he died two years after operation, the amount he could do during these two years showed that he had derived much benefit.

Case 1.—When he was 27 he fainted and was told he had a heart murmur. He had no symptoms except a tendency to faint, and he carried on a busy general practice. When he was 59 he became increasingly dyspnœic, with burning mid-sternal pain on even slight exertion, soon followed by loss of consciousness unless he stopped at once. Aortic stenosis was diagnosed.

His work was proving impossible; so, after two years, aortic valvotomy was performed. He resumed his practice without any more attacks of loss of consciousness, but six months later, on a fishing holiday in Scotland, he had some cardiac asthma. He continued his practice for another year, but there were increasing episodes of cardiac asthma and finally congestive failure, and he died two years after operation.

At necropsy there was much concentric hypertrophy of the left ventricle. The aortic valve was bicuspid with severe calcification, and the opposed, rigid cusps were almost closed. The other valves were normal, and there was only slight atheroma of the coronary arteries.

GOOD RESULTS

Good results were achieved in 5 of the 16 patients—a boy with congenital stenosis (case 11), and 4 adults. All have been followed for a year or more.

The systolic and diastolic pressures on each side of the aortic valve before and after operation are recorded in table II. Fleming (personal communication) has pointed out, however, that the fall in the mean systolic gradient after valvotomy is generally much less than the fall in the peak systolic gradient.

In those cases with good results the pressure gradient was greatly reduced after operation—in 3 cases it fell to about half of what it was before and in 2 cases (9 and 11) it was almost abolished. Only 1 of these (case 9) developed significant aortic regurgitation. In 2 the electrocardiogram was improved, and in 1 the heart became smaller. 1 patient (case 8), however, has died from her cardiac condition, and another (case 7) from carcinoma of the bronchus.

TABLE II—PRESSURE GRADIENT ACROSS THE AORTIC VALVE BEFORE AND AFTER OPERATION

Case no.	Blood-pressure before valvotomy (mm. Hg)				Blood-pressure after valvotomy (mm. Hg)			
	Clinical	In left ventricle	In aorta	Systolic gradient	Systolic gradient	In left ventricle	In aorta	Clinical
1	105/80	...	...	..	70	130/?	60/?	120/80*
2	106/71	96/9	48/34	48	60	130/12	70/52	115/80
3	120/80	216/36	112/76	104	Little change	Little change	Little change	Died
4	102/85	172/8	70/50	102	60	104/8	44/34	Died
5	95/65	192/34	72/53	120	100	205/30	103/58	Died
6	110/80	200/12	77/62	123	132	222/17	92/68	135/85*
7	100/85	125/30	55/37	70	40	100/23	60/43	115/85*
8	120/70	180/8	70/40	110	55	139/12	84/52	120/70*
9	122/100	215/15	73/47	142	20	110/16	90/64	140/80
10	102/77	188/3	94/79	94	59	155/7	96/68	130/90
11	95/65	220/18	92/74	128	12	105/15	93/71	110/65
12	110/80	165/4	83/60	82	31	125/25	95/37	98/58†
13	113/91	153/10	66/52	87	52	114/22	62/39	130/85
14	140/100	115/17	69/58	46	15	87/14	72/38	..†
15	96/74	175/15	53/42	122	14	72/9	58/32	Died
16	115/85	145/9	51/37	94	60	145/17	85/57	..

* Died one or two years later. † Died some months later.

Case 7.—At the age of 38 this man became breathless and within a year he had gross congestive failure. After months in hospital this was eventually controlled with thiouracil, digitalis, and mersalyl; but he easily slipped back into congestive failure. At 46 he had a large heart, right bundle-branch block, severe aortic stenosis without incompetence, but no mitral stenosis.

At aortic valvotomy, the pressure gradient was reduced from 70 to 40 mm. Hg. He returned to work, which he had not been able to do for years. A year after operation his condition was excellent and his heart was smaller with a cardiothoracic ratio of 58% compared with 66% before operation. He then developed fresh symptoms and a lump appeared on his chest wall. On biopsy this proved to be an undifferentiated carcinoma, and necropsy confirmed the cause of death as carcinoma of the bronchus.

Case 8.—A woman, aged 40, had had few symptoms until two years previously, although she knew she had a rheumatic heart. She had then become dyspnœic and had anginal pain on exertion; she had lost consciousness a dozen times and would have done so more often if she had not been careful to stop at the first hint of pain. Finally she could walk no more than 200 yards. There was an aortic diastolic murmur and slight mitral stenosis as well as aortic stenosis. Her attacks of unconsciousness showed the urgent need for aortic valvotomy, but her aortic incompetence and high pulse-pressure (120/70 mm. Hg) were against it.

At operation the aortic valve was found to be fibrocalcareous but could be split readily; the pressure gradient across it was reduced from 110 to 55 mm. Hg; the mitral valve, which was slightly narrowed (1·0 × 1·25 cm.), was divided. A year later she was leading a normal life; she was able to walk 2 miles and never felt faint, although she did all the household tasks, such as shaking rugs and polishing, that gave her attacks before. There was no increase in the aortic incompetence or in the size of the heart. The T-waves were biphasic instead of deeply inverted in leads V4, V5, and V6, and upright instead of biphasic in V3. She remained well for another six months but then died suddenly. While walking with her husband she had severe sternal pain, and she was only able to utter a few words before she became unconscious and died within five minutes.

Case 9.—A woman, aged 48, had been incapacitated with angina for eight years and had had syncopal attacks and cardiac asthma for two years. After aortic valvotomy, the pressure gradient across the aortic valve was reduced from 142 to 20 mm. Hg. She has less dyspnœa and angina, and

she has been free from cardiac asthma and syncopal attacks for eighteen months; but she now has a significant degree of aortic incompetence.

Case 10.—This man, aged 38, had led an active life and played tennis until two years previously, when, after running 200 yards for a bus, he collapsed and became unconscious. He began having angina on hurrying and unless he stopped he soon lost consciousness: during the next year the attacks of angina became more severe and frequent.

At aortic valvotomy, the valve was split freely, and the pressure gradient was reduced from 94 to 59 mm. Hg. A year later he was able to do as much as before his collapse three years previously; he had no anginal pain or any suspicion of loss of consciousness. He still showed inversion of the T-wave in leads V5 and V6, as before operation.

Case 11.—A boy, aged 6, with congenital aortic stenosis, had always been short of breath; but from the age of 4, when he could walk a mile easily, he became worse and developed anginal pain which was severe if he ran for 20 yards. His heart was getting larger: the cardiothoracic ratio in 1950 was 52%, but in 1953 it was 59%.

At aortic valvotomy, the valve was felt to split widely with the expanding dilator and the pressure gradient fell from 128 to 12 mm. Hg. A year later he was able to run about with other boys. There was less left ventricular preponderance and the T-wave inversion had disappeared from leads I, II, and V4 and was much less in leads V5 and V6. There was now a soft aortic diastolic murmur; his blood-pressure was 110/65, and his heart was no smaller.

PATIENTS WHO WERE IMPROVED

5 patients gained some relief from the operation, but less than those classed as good results. Case 1 has been described. Case 6 had led a very active life including whaling in the Antarctic, but for two years he had been disabled by anginal pain. He was somewhat better for the year after operation, but he died suddenly after severe anginal pain and a sharp fall of blood-pressure. Case 2 still has angina and dyspnœa on exertion, but he has had no syncope since operation three years ago and has been able to work which was not possible before. None of the 3 patients showed any great change in the pressure gradient across their aortic valves after operation.

Cases 13 and 16, on the other hand, had moderate reductions in their systolic gradients: the first has not improved as much as was hoped, probably because aortic incompetence has developed; while the second, though he is relieved of symptoms and is back at work, has an aneurysm of his left ventricle.

PATIENTS WHO HAVE DIED

3 patients died at or soon after operation, and 3 some weeks or months later without much improvement. The first 3 (cases 3, 4, and 5) were all men, aged 40–50, with the usual picture that has been described. In case 4 the pressure gradient was reduced from 102 to 60 mm. Hg but in the other 2 there was little change. Cases 3 and 4 have been reported by Campbell and Kauntze (1953) as their cases 32 and 37: in the former the valve was bicuspid but in the latter it was tricuspid, and in both there was heavy calcification; there was no evidence of rheumatic disease of the other valves. Case 5 had gross calcification of his aortic valve.

The other 3 developed free aortic incompetence and this seemed the main reason for their deaths. All 3 showed a good drop in the pressure gradient across the aortic valve at operation (table II).

Case 12 died four months after operation with left ventricular failure; there was a fracture across the calcified part of the aortic valve and the fibrous element was split; the mitral ring was dilated but there was no rheumatic disease.

Case 14 developed free aortic incompetence and died four months after operation with right and left ventricular failure. At necropsy the right posterior aortic cusp was found to be split obliquely; the mitral valve was healthy.

Case 15.—This girl with congenital aortic stenosis had a large heart (cardiothoracic ratio 55%) and a slight incompetence when she was 7 years old. Three years later she became more breathless and had anginal pain on walking uphill or into the wind; and two more alarming attacks led to all her activity at school being stopped. At aortic valvotomy, the pressure gradient across the valve was almost abolished, but severe aortic incompetence and cardiac asthma developed and she died suddenly two weeks later.

DISCUSSION

Some of the problems of valvotomy for aortic stenosis were first discussed by Smithy and Parker (1947) and by Brock (1950). Bailey et al. (1952) emphasised the danger of regurgitation after incision of the valve and Larzelere and Bailey (1953) thought that good results were more likely in rheumatic than in congenital and atherosclerotic stenosis. Later Bailey et al. (1954) reported valvotomy in 62 patients, of whom 27 had aortic valve disease only. In this group the operative mortality was 22%, and though many of the survivors were said to be better, it is not easy to know how much they were improved or how advanced the condition was before operation.

Muller et al. (1954), reporting the results in 16 cases of pure aortic stenosis (13 with calcification), thought that only half the patients were improved: there were 2 deaths. Logan and Turner (1954) held that surgical treatment should be advised before symptoms became severe: their 9 rheumatic cases were somewhat similar to ours but 4 had coexisting mitral stenosis: only 1 of these patients died and the others were said to be improved.

Marquis and Logan (1955) reported the results of operation in 6 patients with congenital aortic valvular stenosis. None died and most of them were improved, but 4 developed aortic incompetence. In retrospect, Marquis and Logan thought it would have been wiser to postpone surgery in 3 of the 6 cases, but the immediate prognosis in the other 3 was bad enough to justify the risk of even severe aortic incompetence. They concluded that progressive left ventricular strain or increasing heart size in growing children were indications for valvotomy.

Many of these papers report a mortality-rate that is not unduly high but they emphasise the risk of producing aortic incompetence. In our experience, neither of these risks is serious with combined mitral and aortic stenosis but both are serious in older patients with pure aortic disease—whether they have trivial incompetence or not—probably because of calcification. If one decides that this risk cannot justifiably be taken until a late stage, the surgeon is given a difficult problem and one must expect a high mortality.

The decision is hard to make, because most patients do well for so many years that any great risk does not seem justified. When deterioration starts, the time before death is often short, and the patient is gravely ill. For example, 3 of our patients died (1 suddenly and 2 with heart-failure) after a decision to operate had been reached.

The poor prognosis and short duration of life after the onset of severe symptoms are well recognised (Kumpe and Bean 1948, Lewes 1951, Bergeron et al. 1954, Mitchell et al. 1954). Matthews et al. (1955) estimate the period between the onset of severe symptoms and death at only one or two years compared with five to ten years in mitral stenosis.

Our results after valvotomy for pure aortic stenosis are much less satisfactory than those for mitral stenosis and for pulmonary stenosis. The 5 good results show that success can be achieved and emphasise the importance of the mechanical obstruction, but the 6 deaths (3 at the time of operation and 3 later) show the difficulties; even among those patients who were improved, 3 died within two years.

One difficulty is that the deformity of the valve by calcification makes it hard to avoid producing aortic

incompetence. The following data suggest that the greater the relief of the stenosis the greater is the risk of producing incompetence.

In the 5 good results, the pressure gradient was reduced to 40, 55, and 59 mm. Hg in the 3 cases where aortic incompetence was not produced or increased, and to 20 and 12 mm. Hg in the 2 where it was produced (cases 9 and 11) though in case 11 (where there was congenital stenosis without calcification) it was only slight. In the patients who were improved the pressure gradient was reduced only to an average of 75 mm. Hg, but even in these cases aortic incompetence was produced in 2 and it was thought to be one reason why the patients were not much better. Of the 6 who died, 3 died at once; in the other 3 the pressure gradient was reduced to between 14 and 31 mm. Hg, but all developed free aortic incompetence, and this was probably the main cause of their deaths.

This risk is increased when the valve is calcified, as it was in all our adult patients. Except for young children with congenital or rheumatic disease, it seems unlikely that many patients will reach a stage of severe obstruction without calcification developing. We have seen it as early as 18 and 24 years of age. This difficulty will be hard to overcome, and McMillan (1955) finds that it is difficult to produce a satisfactory opening even in a necropsy specimen, which must be easier than in a living heart at operation.

Our results, however, show that it is possible to get good results even with a calcified valve, and greater experience in surgical technique or in the selection of patients may overcome this obstacle.

For example, a patient seen recently had moderate incompetence, so that much doubt was felt about aortic valvotomy; but, in view of the good result in case 8 and his increasing disability, the operation would probably have been advised if we had not had the results of left atrial puncture. The left atrial mean pressure was high (22 mm.). Analysis of the records according to the criteria of Gorlin et al. (1955) suggested that the aortic stenosis and incompetence were of equal importance, and that the aortic-valve area had a minimal size of 0·83 sq. cm. (Gorlin and Gorlin 1951). We thought, therefore, that any increase in size was likely to do more harm from additional incompetence than good from relief of the stenosis, and valvotomy was not advised. We are indebted to Dr. P. R. Fleming for these figures and calculations.

Another reason why some of the results are disappointing is that the patients were chosen for operation at a late stage of their disease. 9 of our 16 patients had left ventricular failure and 3 of these had progressed to right-sided failure as well; and all had electrocardiographic signs of severe left ventricular strain. Many had reached an age when independent coronary disease is possible, but we think that generally the signs were due not to this, but to changes in the muscle secondary to the aortic stenosis—changes that may become irreversible if the operation is delayed too long.

Though the poor outlook without surgery made the decision to operate easier in most of these cases, it is clear that the best time for operation had passed. The approach to the aortic valve through the wall of the left ventricle makes it imperative to operate before the muscle of that chamber is irreversibly damaged. When the left ventricle shows signs of failure or pain and syncope denotes severe ischæmia, it may be too late for it to recover, even if its burden is relieved.

If when severe symptoms are evident it may be already too late for successful surgery, we need signs that left ventricular failure is imminent, so that surgery can be considered sooner. The physical signs that point so clearly to the diagnosis are of no help in prognosis because they are compatible with the patient's full activity for many years. An increase in heart size would be a clear warning, but it may come too late. Measurement of left ventricular pressure and the gradient across the aortic valve is difficult and not without danger, so that it has not been possible to accumulate evidence to correlate with clinical and electrocardiographic findings, as in pulmonary stenosis.

The pattern of left ventricular strain in the electrocardiogram seems likely to be the most helpful sign, but more exact knowledge of its prognostic significance is needed. This pattern does not prove that the changes are irreversible, because after pulmonary valvotomy it can often be reversed. The fact that patients stand aortic stenosis well for so long may mean, however, that by the time symptoms appear important left ventricular strain has been present so long that the changes in the muscle are often irreversible. This would suggest that the first sign of left ventricular strain is an indication for surgical treatment; but we think this far from certain, because in some patients it is already present or has been seen to develop gradually during several years while the patient is free from symptoms.

This strain pattern is, however, seen more often in those who already have symptoms. Thus of the 40 patients reported by Campbell and Kauntze (1953), 24 showed this pattern: 17 of these had symptoms of moderate severity but there were few symptoms in 7, 4 of whom were children aged between 4 and 9, where the absence of symptoms is less decisive. In contrast to this, among the 16 patients with no strain pattern, 9 had only slight symptoms, and 7 had none.

The most hopeful cases seem to be the young patients with congenital aortic stenosis where the valve is not calcified, but many of these do well without operation; it should, therefore, be advised only when they are losing ground. Of 2 such patients in this series, 1 died with free aortic incompetence; but 2 boys, aged 9 and 13 (cases 9 and 11, Campbell and Kauntze 1953), have since had operations with good results.

The first had not changed much clinically during five years, but T-wave inversion in lead V6 had developed in the electrocardiogram. In this case the pressure gradient across the aortic valve was reduced from 72 to 24 mm. Hg.

The second boy was hardly disabled in 1950 but had lost ground in 1952; he was much the same in 1955 except for increasing left ventricular strain (T-wave inversion in V4–V6). Operation was therefore advised and the systolic pressure gradient was reduced from 144 to 13 mm. Hg without producing aortic incompetence.

Patients with aortic stenosis who have symptoms or a left ventricular strain pattern must be watched closely. They should be considered for surgery at the earliest sign of deterioration. Some patients do well for a long time after the electrocardiogram has shown signs of left ventricular strain, but these signs in a growing child (Marquis and Logan 1955), or their progression in an older patient when symptoms are getting worse, probably indicate the best time for surgery. The chances of success will be better if the valve is not calcified; but even then the risk of producing incompetence cannot be ruled out (case 15).

It is important to emphasise to patients that surgery can improve their prognosis and enable them to lead a fuller life, but that complete restoration of normal valve function and normal activity is unlikely. Such complete restoration is what they naturally hope for, and, unless they are warned, they will expect it.

Summary and Conclusions

In isolated aortic stenosis, valvotomy is less successful than it is in mitral or pulmonary stenosis.

We report the results of aortic valvotomy in 16 patients. 6 died and in only 5 were good results achieved. Even among these 5, 1 died within eighteen months.

The main danger of the operation is the production of aortic incompetence. The reason for this is that in adults with advanced disease the aortic value is calcified and deformed.

In children with congenital aortic stenosis, valvotomy should be considered when they have anginal pain or syncope on exertion, when left ventricular strain is increasing, or when the heart is enlarging.

In adults with isolated aortic stenosis, increasingly severe symptoms are indications for valvotomy before there is heart-failure or irreversible fibrosis of the heart muscle. The chance of success is greater if the valve is not calcified, but this is unusual.

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ACUTE MASTITIS

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Two kinds of acute mastitis associated with pregnancy and lactation are well recognised, the superficial and the intramammary (Waller 1938, Romanis and Mitchiner 1952), but their essential differences are often not appreciated.

Superficial mastitis is here viewed as either a staphylococcal infection of the skin or a Montgomery tubercle which penetrates into the breast. Intramammary mastitis, even when declared by an accompanying rigor, is believed to be non-infective at first, although staphylococcal infection may soon supervene. Both kinds of mastitis are common, painful, and largely preventable.

Incidence

The incidence of mastitis has been as high as 8·91% in the mothers giving birth in an area where the condition was notifiable (Fulton 1945), 7·0% in mothers delivered in hospital among a representative sample of Britain (Douglas 1950), and 2·6% in Newcastle upon Tyne (Spence et al. 1954).

Ætiology

Two main views are held about their cause: Waller (1938) emphasised the importance of sore nipple, and Macpherson (1943), Walsh (1949), and Czermac (1952) drew attention to the prime importance of stagnation and retention of milk. The figures published by Blaikley et al. (1953), though small, confirm the belief that the incidence can be reduced by antenatal and puerperal care.

Present Investigation

The courses of the two diseases and the conditions associated with them in 129 cases seen in the two years from September, 1951, to September, 1953, were analysed and contrasted. All the cases were in women delivered by the staff of University College Hospital and include all those which we treated, or of which we heard, in pregnancy or during or after lactation.

The term mastitis is used here to describe not only frank cases but also the very least conditions which, for reasons given below, are held to be incipient mastitis. There were 25 cases of superficial mastitis and 109 of intramammary; 5 patients had both types at some time. In the two years there were 2701 deliveries under the care of the hospital. Although the patients seen were not necessarily delivered in this period, the rates of incidence may be taken as 4·2% for intramammary mastitis and 1·0% for superficial mastitis, and the incidence of intramammary abscess was 1·1%. In six months in 1955 the rates were: superficial mastitis 1·0% and intramammary mastitis 0·9%, and there have been 1 intramammary abscess in pregnancy and 1 in lactation in 717 cases (2·1%).

SUPERFICIAL MASTITIS

Superficial mastitis could be seen to have begun, in all the patients coming early for treatment, either as an infected Montgomery tubercle or else as a spot on the areola or on the skin close to it. As it progressed, a lump formed which was found to consist of pus, however early it was incised.

The early course of the mastitis was slow, and those patients who came later for treatment could seldom say definitely when the inflammation had begun. This slow early pace suggests that the causes should be sought in the preceding days rather than in the days of onset. No patient in this series was seen to have superficial mastitis in the first ten days after delivery, but the frequency with which it arose in the next ten days after leaving hospital suggested that the cause lay in the earlier period.

Those patients who came when the mastitis was established complained either of pain or of a lump. Only 1 had pyrexia in the course of the illness, and her temperature only rose as she developed a superimposed intramammary mastitis (fig. 1). Except in 4 patients whose lesion was seen before the indurated lump was as large as a pea, improvement did not last if the pus was not discharged either spontaneously or through an incision. Unopened abscesses tended to track behind the nipple, and pus escaped out of the nipple of 1 patient. Apart from this case, where mechanical difficulty prevented suckling and there was the risk that the baby might

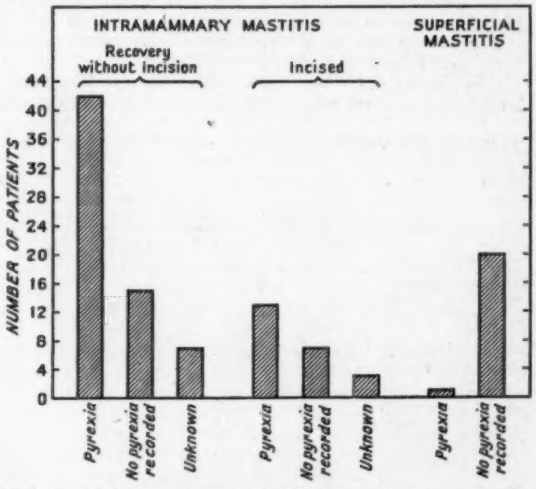

Fig. 1—Pyrexia in intramammary mastitis does not mean pus, pyæmia, or poor prognosis.

swallow pus, the course of breast-feeding was not altered by superficial mastitis.

The infecting organism in every instance examined was *Staphylococcus pyogenes*. The in-vivo sensitivity of the staphylococcus to antibiotics did not necessarily tally with its in-vitro sensitivity. Although the resistance of superficial mastitis to penicillin therapy may have been due to the fact that the mother derived her staphylococci from the resistant strains commonly inhabiting hospitals, penicillin 1,000,000 units daily seemed to be less effective than would be expected on that score alone.

There was a firm association with concurrent infection. Of the 24 cases of superficial mastitis, either alone or preceding intramammary mastitis, in 14 infection which was, or may be presumed to have been, staphylococcal, was present either in the mother or in her baby or her husband; and in the 25th case an intramammary abscess had been incised. Thus 60% may be said to have had concomitant staphylococcal infection (table I). Manual expression of colostrum after delivery appeared to have increased the incidence of this kind of mastitis; although it was not much practised in the wards 13 of the patients had used it.

Treatment

Prevention evidently consists in avoiding infection of the skin of the areola, which is very vulnerable to trauma and chemical irritants. Antiseptic applications have been avoided so far as possible; but, since the strong association with concurrent infection has been recognised, mothers who have pustules or whose babies have paronychia or staphylococcal conjunctivitis are recommended to use a bactericidal soap when washing their trunk. The use of penicillin cream on the nipple or a spot seems quite unjustifiable. Likely causes of pustules on the breast are also avoided where possible: rubber linings to brassières are discouraged, and adhesive plaster is not used in dressing an abscess for fear of causing another. Treatment usually consisted in giving an antibiotic and opening the abscess.

Since several of these patients had already been treated elsewhere, the numbers allocated early enough to different forms of treatment are too small to show their relative merits. Table II gives the numbers receiving each treatment and shows how many resolved and how long the unresolved took to reach the stage of incision or spontaneous discharge. Of the 12 abscesses treated initially with penicillin only 1 resolved. The 11 others seemed to take longer than usual to ripen for incision; and, since incision was in the end inescapable, the penicillin was of doubtful service. The initial use of either aureomycin or chloramphenicol apparently cured the mastitis in 3 of 6 cases.

Our present practice is that, if the lesion is still scarcely larger than a lentil when first seen, aureomycin 250 mg. six-hourly is given. The effectiveness of this treatment is visible within forty-eight hours. Where it is ineffective, or where the induration is already as large as a pea, antibiotics are considered less necessary, unless the infection appears to be exceptionally virulent, since evacuation of pus is sure to be necessary ultimately and has to be undertaken as soon as it is physically possible.

A stab incision under brief general anæsthesia and preservation of the cavity walls by refraining from using sinus forceps to open the cavity will, if undertaken early enough, enable the mother to continue breast-feeding, unless the incision is very close to the nipple. The incision is best made at the margin of the areola. It is of course absolutely essential for the breast to be emptied as often and as well as it had been before. If emptying is impracticable, suppression of lactation must be started in good time to avoid unnecessary suffering and to prevent superimposed intramammary mastitis.

TABLE I—CONCURRENT INFECTION ASSOCIATED WITH SUPERFICIAL MASTITIS

Type of mastitis	Superficial only	Intramammary only	Superficial succeeded by intramammary	Intramammary succeeded by superficial
Number of cases	20	104	4	1
Site of associated infection:				
Baby:				
Skin	3	4	1	..
Conjunctiva	3	5	..	1
Abscess	0	1	..	..
Mother:				
Skin	5	2	1	..
Conjunctivitis	0	1	..	..
Vulval abscess	0	1	..	..
Urine (staph.)	0	1	..	..
Father:				
Barber's itch	1	0	..	..
Total no. of cases with infection	12 (60%)	15 (14%)	2	1

TABLE II—RESULTS OF ANTIBIOTIC TREATMENT OF SUPERFICIAL MASTITIS

Antibiotic	No. of cases	No. resolved without opening	Duration of mastitis before opening (days)
None	5	0	2–6
Penicillin alone	8	1	6–21
Aureomycin 1 g. daily	4	2	1–4
Chloramphenicol 1 g. daily	2	1	27
Penicillin followed by aureomycin	4	0	2–9
Unknown	2	..	..
Total	25	4	..

INTRAMAMMARY MASTITIS

Intramammary mastitis is characterised by pain in the breast, a lump in the glandular tissue, a flush of the skin over the affected area, pyrexia, and reduction of secretion from the affected breast. The most constant and important of these symptoms and signs is the lump. Although a lump may be present in a lactating breast without amounting to mastitis, the other symptoms and signs have not been seen where there was no palpable lump in any case in this series or in the many other cases seen. In the present 109 patients the criterion of mastitis was therefore taken to be the presence of at least one other symptom or sign besides the lump. All 109 patients had pain, and 71 had pyrexia. On this basis of diagnosis no difference could be drawn, in the early stages of intramammary mastitis, between the condition of the mother with intense engorgement and pyrexia which resolved entirely on emptying the breast and the case where resolution by emptying was not obtained and an abscess resulted.

This preliminary stage, when intramammary mastitis is manifest yet resolvable, presents features which are hard to reconcile with the usual view of intramammary mastitis. The assumption was often made in the past that the condition of the breast and the pyrexia were due in the first place to bacterial invasion, but Romanis and Mitchiner (1952) comment that engorgement of the breast may be regarded as the first stage in intramammary mastitis.

In the present series 77 patients (71%) recovered completely without detectable residual induration, and a further 10 did not require incision (fig. 1). Since most of the patients were given antibiotics, the defeat of the bacteria may have caused healing and restoration of the normal tissues of the breast, but antibiotics were not essential for this, because 4 patients had thirteen pyrexial attacks with retention which resolved entirely on emptying the breasts at home without other treatment. Recovery like this was often seen before the advent of antibiotics, as Isbister (1952) has remarked.

If the first cause of intramammary mastitis is infection, what is the lump made of? In these cases removal of the secretion rather than the usual defences against bacteria brought cure. In all the cases under observation the secretion obtained by emptying the affected breast, even when the lump disappeared in the process, was milk, not pus. No baby was made ill by continuing to feed from the breast, and this was allowed for the first two days of illness and afterwards, if improvement was steady. There is no doubt that the lump consists of secretion and its containing breast tissue and is so much a part of the mammary gland that it is best palpated by the finger-tips rather than the surgical flat of the hand. Although no patient in this series was operated on in what was literally the first flush of mastitis, cases have been seen in which a free incision through the lump has revealed apparently normal tissue.

The records of these cases of mastitis provide two other pieces of information which are obstacles to accepting infection as the cause. The concurrent apparently staphylococcal infection rate of 18%—4 patients with preceding superficial mastitis and 15 others (table I)—is little greater than the average for mother and child in the wards, whereas the rate among the patients with superficial mastitis was 60%. Then there is the remarkable fact that, although in every instance where the mastitis led to an abscess and this was incised the organism was *Staph. pyogenes*, there was not one pyæmic abscess, even though at the outset of the mastitis the patient's temperature had risen sharply to 104°F with a rigor. Either a second organism, never seen, causes the mastitis and, carried round the body, also causes a transient septicæmia, or else the cause of the pyrexia is non-infective. Attempts to find an organism have failed on the five occasions when blood was taken for culture as the temperature rose. The hypothesis of the independence of the pyrexia and infection is supported by the fact that prognosis is unaffected by pyrexia (fig. 1).

The subjective account given by patients during the pyrexia of mastitis is conspicuously like that of one suffering from an incompatible transfusion or from an intravenous dose of pyrogen. Typically the mother considers herself to be well or may already have noticed a slight headache or a tenderness in her breast and then, after emptying her breast by feeding or by artificial means, she suddenly collapses with pyrexia and a rigor. In the present series this happened in 5 patients, all of whom recovered entirely without abscess formation. A subjective account was that the patient "ached all over, down her legs and up her neck, and she felt as if she had been sleeping on boards." This reminds one of the days before the rhesus factor and pyrogens were known, when reactions to transfusions were common and every bottle of blood or of saline solution causing pyrexia was searched, usually in vain, for infection. The concept of bacteria causing pyrexia hindered doctors from thinking of other causes.

I suggest that, in intramammary mastitis, the sequence of events is as follows: retention of milk in a lobule of the gland either from failure to empty or from excess secretion, increased viscosity, or blockage of the duct; high pressure within the captive secretion; attempt at contraction of the myo-epithelial cells when the draught reflex comes into action; and leakage or even rupture of the alveoli or duct, with extravasation of the pent-up secretion. Since the breast is very vascular, the secretion may enter the blood-stream and have a pyrogenic effect comparable to that of cow's milk in humans. As Walsh (1949) has suggested, bacterial infection of extravasated milk and the surrounding tissue may then readily ensue and may also arise in merely pent-up secretion. There is some experimental backing for this hypothesis, for Selye et al. (1934) found that, in rats and mice, if the milk ducts were ligated and suckling maintained, milk was extravasated into the gland. In man the rigor or milder pyrexia usually comes on while the breasts are full or immediately after a feed and not in the two or three hours while the breasts are relatively empty. These are the times most likely to have been preceded by a draught reflex with its transient high intra-alveolar pressure.

Intravenous injection of a patient's own milk was not tried, because of the obvious difficulties not only of distress but of preparing an aseptic unaltered sample of milk. Milk 0·1 ml. given intramuscularly caused no pyrexia. To produce pyrexia where there is retention of milk previous sensitisation is apparently unnecessary, since such reactions were observed, and cured by emptying only, in 5 primiparæ in the first week after delivery. On the other hand, frank mastitis with a painful lump and a flush was seen in 7 cases without any detectable rise in temperature.

One argument in favour of a bacterial origin of mastitis is its common association with sore nipple. This is not convincing, for soreness usually develops when the breast is not taken properly, owing to its poor shape or to faulty posture of either the mother or the baby; these same factors, as Cruickshank (1942) has pointed out, also cause faulty emptying. In addition, soreness may make adequate emptying difficult, and trauma caused by emptying may be followed by mastitis. Furthermore, mastitis is seen where there has been no lesion of the nipple (Macpherson 1943); in pregnancy (2 cases in the present series); and where the baby has not been put to the breast at all. It can arise most unhappily in the breast of a woman given inadequate œstrogens to suppress lactation after a stillbirth.

Reasons have been given for rejecting the hypothesis of bacterial invasion as the first cause of intramammary mastitis. The histories of the patients support the hypothesis of retention. In common with Isbister's (1952) cases, factors or events conducive to faulty emptying were unduly common among the 109 women in whom this form of mastitis developed. There were 130 attacks after delivery. The 30 which developed during the ten-day lying-in period (and therefore under observation) were all associated with one or more of the following conditions: excess secretion with engorgement and much manual expression; sore nipples in breasts with poor protractility; an ill or small baby; physical obstruction to removal of milk (e.g., an adenoma and a scar); fear of giving the breast (in patients with healed pulmonary tuberculosis or with close relations who had had breast abscesses); and puerperal psychosis (2 cases).

Similar causes were found where mastitis arose later in lactation: 8 attacks followed resting sore nipples; 4 arose from physical obstruction; 5 from acute anxiety in the mother; and in 17 patients mastitis developed on twenty-two occasions after interruptions due to family emergencies or cutting down the number or duration of feeds or giving supplementary feeds without regard to the breast secretion. Most of these interruptions were made on medical advice. One patient provided an example of a condition which has been seen outside this series: when the area of retention yielded its milk to the 'Humalactor,' small pearly objects were seen which proved to be agglutinates of colostrum bodies and may have caused obstruction. Their origin is unknown, but in vitro colostrum bodies agglutinate on cooling.

Failure to keep the breasts emptied during weaning preceded fourteen attacks of mastitis: 4 patients did not attempt to empty the breast at all after starting a course of œstrogens; 5 were given inadequate doses of œstrogens; and 5 just ceased to put the baby to the breast and sought no help, for fear of having to continue feeding. This reckoning of precipitating causes leaves 29 cases with no clear cause; included in their number are some patients who seem either to have a predisposition or

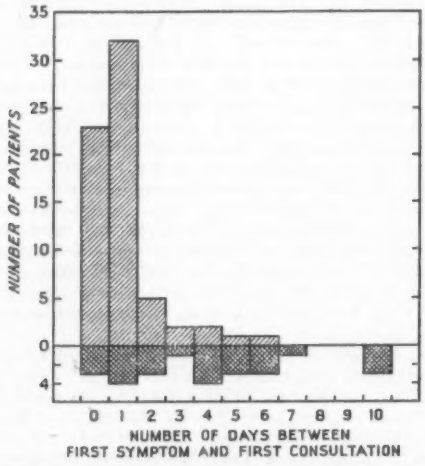

Fig. 2—Importance of early treatment of intramammary mastitis: *above line*, complete resolution; *below line*, residual lump or scar from incision.

else to have had a recurring cause—e.g., temperamental babies—since between them they had forty-four attacks.

Probably many women have transitory attacks—complete with pain, lump, and pyrexia—repeatedly during lactation. Where the mother thinks little of the signs in her breast, the condition can easily be mistaken for influenza. Mastitis should always be suspected when influenza is diagnosed in a woman who is, or who has been recently, lactating.

Analysis of the incidence of mastitis shows that there was a preponderance of primiparity and of girl babies, which fact suggests that these factors may have contributed to the failure of emptying. Primiparæ, whose breasts offer greater difficulty in suckling (Gunther 1955a), were in the ratio of 76 to 31 multiparæ, whereas the intake of the hospital was 1651 primiparæ to 1054 multiparæ ($\chi^2 = 4{\cdot}67$, $p<0{\cdot}05$). Dean (1951) has shown that, in the first days of life, girls take less milk than boys do. There were more girls than boys among the children of those who developed mastitis in the first ten days: 20 girls to 10 boys ($\chi^2 = 3{\cdot}99$, $p<0{\cdot}05$). But in the children of all the mothers who got mastitis there were only slightly more girls (55 girls to 50 boys from among 1247 girls and 1308 boys born). In an earlier investigation the mothers of small babies were found to be particularly at risk, but in this series that was not so, perhaps because the risk was known.

Treatment

The most important part of treatment, as Walsh (1949) pointed out, is to begin early (fig. 2). If infection comes, the organism will be *Staph. pyogenes*, and antibiotic therapy, not sulphonamides, should be given for prevention. Since the mastitis is due in the first place to failure of emptying, emptying must be maintained during treatment and while œstrogens take effect, if suppression is decided on. The urgency of treatment depends not only on the threat of infection but also on the finding that the lump is likely to empty its contents in the first day or two of the disease, but that if it has not done so by the third day it is unlikely to do so at all.

Since in the present cases and in many others no ill effects followed breast-feeding in the first days, this obvious way of dealing with the secretion of milk in the first two days was taken where the mother was willing to continue. In a few cases the pain of feeding was too great; and, since this was worst when the draught reflex was strongly induced, the humalactor milking-machine, which evokes a weaker reflex, was found to withdraw new secretion less painfully than the baby could; and by virtue of its being able to act for fifteen to twenty minutes on a breast without causing trauma it would sometimes withdraw the pent-up secretion where the baby would lose interest in five minutes and fail in the job.

It was found that, where the lump was not diminishing by the third day, an abscess was likely to be formed, and then resolution would usually take place only if lactation was suppressed. It seemed better to suppress lactation as soon as quick resolution became improbable. In this way slow but complete resolution, a cold abscess, or at worst a small abscess is likely to be the outcome. In this series 3 patients had had penicillin for some days before they came to us with a deteriorating mastitis, but whose lactation had not been suppressed; and only in them did we see the extensive destruction of breast tissue, the copious pus, and the ugly scarring which is the terror of mastitis. The deleterious effects on mastitis of suckling, once infection has set in, may be partly due to the spread of infection by the pumping action of the draught reflex within the breast (Gunther 1955b).

The end-result may also be poorer if secretion is allowed to persist until the time of incision, because fresh areas of retention are then hard to avoid on the day after incision. Fig. 3 shows the relation of the final outcome, in cases where lactation was suppressed and antibiotics were used, to the times when suppression and antibiotics were started. The interrupted line in the figure encircles the entries relating to patients where emptying was also done. It will be seen that neither suppression of lactation, even if it precedes mastitis, nor antibiotic therapy given early is as effective as both procedures together with emptying of the breast.

The object of incision is of course to drain the abscess with the least residual scarring not only of the skin but also of the mammary tissue. With the proviso that the secretion of milk should already have been largely suppressed, and that drainage is judged to be ultimately necessary, the sooner the incision is undertaken the better. Much unnecessary destruction of the breast can result from waiting to be confident of fluctuation; and, where there is doubt about the presence of pus, the lump should be explored with a needle under general anæsthesia and

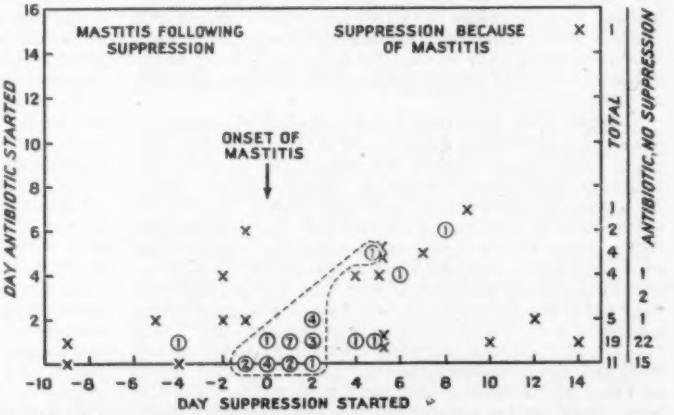

Fig. 3—Relation of outcome to time of starting antibiotics and suppression: *interrupted line* contains cases in which emptying was achieved; X, subsequently incised; *numerals* in rings denote number of cases which resolved.

TABLE III—RESULTS OF ANTIBIOTIC TREATMENT OF INTRAMAMMARY MASTITIS

Antibiotic	No. resolved	No. incised		
		Organism resistant	Organism sensitive	Unknown
Penicillin	61	7	2	4
Other	12	..	1	2
Penicillin and other ..	7	5	2	2
None	18	..	2	..
Unknown	3	..	..	7
Total	101	12	7	15

incised if pus is found. Like Saner (1950) we have been impressed by the benefits of a small radial skin incision, which rarely needs to be as long as 1 inch. If the breast is still secreting milk, emptying should have been maintained and done not more than an hour before operation. By this means the outline of the lump is delineated, and the surgeon can be certain of the extent of the abscess and avoid opening up loculi. Aspiration without incision, where tried, has had to be followed by incision, and local penicillin injections have produced lasting indurated lumps in the breast without curing.

A method introduced by Miss Aileen Dickins of dressing abscess wounds was adopted in which ribbon gauze, newly dipped in sterile penicillin-cream base, is led into the cavity and left untouched for forty-eight hours. The discharge of pus, provided the gauze constitutes a wick and not a pack, is very satisfactory; and the dressing causes the minimum of pain to the patient. All patients needing incision were admitted to hospital.

The antibiotic of first choice for preventing infection has remained penicillin (table III). In contradistinction to superficial abscesses, intramammary mastitis appears still to be protected from infection by aqueous penicillin 1·0 mega unit daily or 0·5 mega unit twice daily from infection. Once penicillin is deemed necessary, the dosage should be maintained for at least four days. When infection has probably taken place already, aureomycin is used.

Course of Infection

The infecting organism in all abscesses which were incised was *Staph. pyogenes* and, except for secondary infection after incision, it was the only organism found in all the cases I have seen in fifteen years. This conforms with the experience of Macpherson (1943), Walsh (1949), Saner (1950), and Isbister (1952). Duncan and Walker (1942) and Cunliffe (1949) have shown that *Staph. pyogenes* is also found in the noses and throats of babies very soon after birth, and discussion has often arisen about the source of infection—does the breast give it to the baby, or the baby to the breast?

Staphylococci, even virulent pathogens, appear to be protean, and from the infected person's point of view the size of the infecting dose of organisms appears important. In terms of the organism the heavy dose derives from where the organism can multiply. If it is conceded that staphylococci abound wherever there is stale breast-milk or colostrum—in the pent-up secretion of the breast, in the neonate's nasopharynx, and on the finger-tips and in the eyes, where colostrum and milk may easily get, and even in witch's milk—it seems reasonable to postulate that breast secretion is a vehicle of a growth-promoting system (either a combination of factors or, like bifidus factor, a single substance) which affects *Staph. pyogenes*. The remarkable fact is that where breast secretion is pent up, even without the aid of a skin lesion or trauma, in regions remote from airborne organisms, even at the periphery of the gland in pregnancy, staphylococci establish themselves and may cause an abscess. If indeed stale secretion contains an almost specific means of promoting the growth of staphylococci, the sepsis-rate of neonatal skin may be expected to rise where the expression of colostrum is not followed by adequate washing of the hands. The determining factor of clinical infection would then be the provision for the organisms' multiplication, which is less common, rather than the arrival of the organism, which is almost inescapable. The inhibitory qualities against bacteria which fresh colostrum possesses do not rule out the possibility that fresh or altered secretion contains growth-promoting substances. Auclair (1954) has suggested that bovine colostrum may contain specific growth-promoting substances for *Streptococcus agalactiæ*.

Prophylaxis

Prevention of intramammary mastitis consists in the avoidance of retained secretion. In point of time antenatal treatment for poor protractility of the nipple comes first. This enables the baby to take the breast vigorously and effectively from within a few hours of birth. Antenatal expression of colostrum puts control of excess secretion into the mother's hands during lactation. After delivery engorgement should be avoided, for it is often at this stage that an unemptied lobule becomes unemptiable.

Since this investigation ended, a routine has been introduced which almost completely avoids engorgement. Each woman, except those aged more than 35 and those who have been shocked or who have been delivered by cæsarean section, receives two tablets of stilbœstrol 0·25 mg. within two hours of delivery and one tablet twenty-four hours later. By this method and the occasional use of the humalactor, handling of the breasts before the fifth day by either the mother or the nurse has been largely eliminated. These methods are defeated if care is not taken to see that the baby takes the breast properly, and this duty of the midwife is increased where pain from episiotomy or following obstetric interference immobilises the mother.

The proper protractility of the nipple and the proper position of the baby at the breast are also safeguards against sore nipple and its sequelæ. Demand feeding in the early days and night feeding from the breast also help, and anyone who sees the distension of the mother's breasts in the puerperium after eight hours at night in which the baby has not been breast-fed must wish that hospital routine, where demand feeding may have drawbacks, should provide for the mother to feed her baby at 3 or 4 A.M. and then sleep until 7 A.M.

Milk retention and mastitis during lactation would often be avoided if those advising on infant feeding would recognise that the rate of secretion usually remains approximately constant day in day out. Any event which reduces the amount of milk withdrawn—the dropping of a feed, or the giving of supplementary feeds—may be followed by mastitis, unless the mother has the knowledge and skill to avoid retention. The time of weaning was shown in this series to be one of vulnerability. There appear to be three requirements: adequate œstrogens, judgment in keeping the breasts empty while the œstrogens take effect, and the need to accept the mother's intention to discontinue feeding. Are there those who almost view mastitis as a punishment on the mother?

Œstrogens given to suppress established lactation do not take much effect in the first twenty-four hours. Although there is much individual variation, the mother should breast-feed her baby as usual on the day of starting treatment, about three times on the next day, and twice on the next. If the course of œstrogens is not tapered or is short, lactation may return at the time of œstrogen-withdrawal bleeding. Since our practice over four years has been to give the following course, no patients have had mastitis with this method of

suppression: stilbœstrol 5 mg. thrice daily for three days, twice daily for three days, once daily for three days, and then 1 mg. thrice daily for two days, twice daily for two days, and once daily for two days.

Summary

129 cases of acute mastitis were studied.

Superficial mastitis was found to be associated with other forms of staphylococcal infection and, except for the very early stages, to resist antibiotic treatment.

Reasons are put forward for ascribing the lump, pain, flush, and pyrexia of intramammary mastitis to retention of milk and not in the first place to infection. At first, pyrexia does not signify pus, pyæmia, or poor prognosis.

The outcome depends mostly on the time of starting treatment, which should consist of antibiotic protection, emptying of the breast, and local heat.

Prevention is thought to consist in ensuring adequate emptying of the breasts, which can be assisted by antenatal care and by suggested methods of managing lactation until weaning is complete.

The pyrexia of early intramammary mastitis is probably due to pyrogens not of bacterial origin.

Sites holding stagnant colostrum or milk are commonly infected by *Staph. pyogenes*.

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ACUTE BARBITURATE POISONING

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ACUTE barbiturate poisoning has become a serious problem in many countries. Several workers have commented on the increasing incidence of such poisoning, and the relatively large number of fatalities (Nillson 1951, Moore et al. 1952). The number of cases admitted to this hospital has increased from 3 in 1945 to 41 in 1954. Once such patients are admitted to hospital their chances of survival are greatly increased, and early diagnosis is probably the most important factor in reducing the number of deaths. Biochemical analyses can be of great value in confirming the diagnosis rapidly, assessing the severity of the poisoning, and following its course.

In the past, methods for the estimation and identification of barbiturates in biological material have been slow, tedious, and insensitive, and the rôle of the laboratory usually limited to confirming the diagnosis by qualitative tests on urine and gastric contents. The introduction of ultraviolet spectrophotometric methods (Walker et al. 1948, Goldbaum 1952) has enabled barbiturates to be rapidly and specifically estimated in any material; but since the toxicity of barbiturates differs considerably, quantitative analysis is of limited value unless the drug can be identified (Wright 1954). A spectrophotometric method, by which barbiturates may be estimated and partially identified within an hour (Broughton 1956), now enables results to be available in time to aid in the treatment of patients.

TABLE I—CLASSIFICATION OF BARBITURATES

Barbiturate	Proprietary names	Substituents on 55′ position	Duration of pharmacological action (Martindale 1952)
Phenobarbitone ..	'Luminal'	Ethyl phenyl	Long
Barbitone	'Veronal' 'Medinal'	Ethyl ethyl	Long
Butobarbitone ..	'Soneryl'	Ethyl n-butyl	Intermediate
Amylobarbitone ..	'Amytal' *	Ethyl iso-amyl	Intermediate
Cyclobarbitone ..	'Phanodorm'	Ethyl cyclohexenyl	Short
Quinalbarbitone ..	'Seconal' *	Allyl 1-methylbutyl	Short
Pentobarbitone ..	'Nembutal'	Ethyl 1-methylbutyl	Short

* 'Tuinal' is a mixture of amytal and seconal, and its action is "short."

We record here the results of analyses of specimens from 36 patients, of whom 1 died, who were admitted to this hospital between March, 1952, and August, 1955, and from 10 persons found dead, after the ingestion of commonly prescribed barbiturates.

Materials and Methods

Most of the living patients in this series were unconscious on admission to hospital; and, with many, biochemical analysis was necessary to establish the diagnosis. Samples of blood, urine, and gastric contents were analysed during recovery. Necropsy specimens of blood, urine, cerebrospinal fluid (C.S.F.), liver, kidney, and intestinal contents, taken from patients found dead, were also examined.

Blood-barbiturate levels were determined in 25 cases (nos. 4, 5, 13, 14, 17) by the method of Walker et al. (1948), and in the remainder by a modification (Broughton 1956) of Goldbaum's (1952) method. The barbiturates ingested are listed in table I. These were identified from the patient's history, by measurement of the amount of alkaline hydrolysis under standard conditions (Broughton 1956), or by the methods described by Turfitt (1948). Barbiturates may be prescribed as either the acid or the sodium salt, and all levels reported here are of the acid form of the particular 55′ disubstituted barbiturate named.

The degrees of consciousness of these patients are defined as follows:

U = unconscious: does not respond to painful stimuli, such as strong supra-orbital pressure.

S = semiconscious: responds to painful stimuli, moving and groaning, but unable to talk.

D = drowsy: answers simple questions, but falls asleep if undisturbed.

A = awake: rational.

Consciousness was said to have returned when the patient regained the ability to answer simple questions.

Results

LIVING PATIENTS

The highest blood-barbiturate levels found in patients after their admission to hospital, together with the dose

(where known) and their state of consciousness, are shown in table II. For each barbiturate the blood-level appeared to be related to the degree of consciousness of the patient. Analyses were made at different times after the dose, and it is therefore difficult to detect any absolute correlation between dose and blood-level. However, long-acting barbiturates produced higher blood-levels than similar doses of the short-acting ones. For example, cases 1 and 34 had taken comparable amounts of phenobarbitone and pentobarbitone, yet their blood-levels at similar times after the dose were 10·2 and 6·1 mg. per 100 ml. respectively.

The fall in blood-levels in 4 patients who had ingested different barbiturates is illustrated in fig. 1. Blood-levels of the long-acting drugs were higher, and the rates of fall slower, than those of the short-acting ones.

Thus in case 17 the blood-level was 18·5 mg. barbitone per 100 ml. 19 hours after the dose, and 1·9 mg. per 100 ml. 10 days later when the patient had recovered.

Case 3 was admitted to hospital within 2 hours of ingesting phenobarbitone, and the blood-level continued to rise for about 12 hours. 7 days after taking the drug the patient was awake, but the blood still contained 4·0 mg. phenobarbitone per 100 ml.

Patients who had taken short-acting barbiturates usually recovered more rapidly; for example, in case 34 only 0·7 mg. pentobarbitone per 100 ml. blood remained $3^1/_2$ days after the dose.

The rates of fall of blood-levels in patients who had taken the same barbiturate were similar but showed some individual variations, depending on the dose and the treatment given. Results for 3 patients who had ingested barbitone are given in fig. 2; the rates of fall are similar, although the peak blood-levels (18·5, 15·1, and 8·0 mg. per 100 ml.) differed considerably. 2 of these patients (cases 17 and 18) remained unconscious for 6 days. Fig. 3 shows similar results, obtained from 4 patients after ingestion of amylobarbitone, in whom the peak blood-levels were 9·4, 7·3, 6·1, and 4·4 mg. per 100 ml.; these patients all regained consciousness within $2^1/_2$ days.

TABLE II—HIGHEST BLOOD-BARBITURATE LEVELS FOUND IN LIVING PATIENTS

Barbiturate	Case no.	Age (yr.)	Dose (g.)	Hr. after dose	State of consciousness	Blood-barbiturate (mg. per 100 ml.)
Phenobarbitone	1	28	4·5	13	U	10·2
	2	35	..	15	U	9·9
	3	31	..	31	U	9·0
	4	..	..	17	U	8·5
	5	41	2·9	12	U	6·6
	6	4	..	18	S	6·1
	7	61	0·6	5	S	5·3
	8	57	..	31	D	4·2
	9	50	1·2	6	D	3·3
	10	37	0·4	7	D	2·8
	11	44	..	14	D	2·8
	12	22	1·0	17	A	2·2
	13	21	1·5	14	A	1·8
	14	..	..	..	A	1·6
	15	42	1·5	82	A	1·3
Barbitone ..	16	67	22+	35	U	53·0
	17	69	..	19	U	18·5
	18	67	..	72	U	15·1
	19	46	..	19	D	8·0
Butobarbitone	20	27	..	12	U	7·7
	21	31	..	9	S	2·9
	22	40	..	3	U	2·6
	23	47	1·0	7	D	1·6
Amylobarbitone	24	65	..	12	U	9·4
	25	33	4·1	3	U	7·3
	26	30	7·0	7	U	6·1
	27	63	..	19	U	4·4
	28	70	..	15	U	3·1
	29	50	6·2	36	U	3·0
	30	36	..	4	S	2·4
	31	30	..	15	A	1·8
Tuinal	32	48	..	21	U	5·0
Cyclobarbitone	33	63	..	12	U	4·5
Pentobarbitone	34	24	5·3	15	U	6·1
	35	63	..	3	U	2·9
	36	39	..	3	S	2·1

U = unconscious. S = semiconscious. D = drowsy. A = awake.

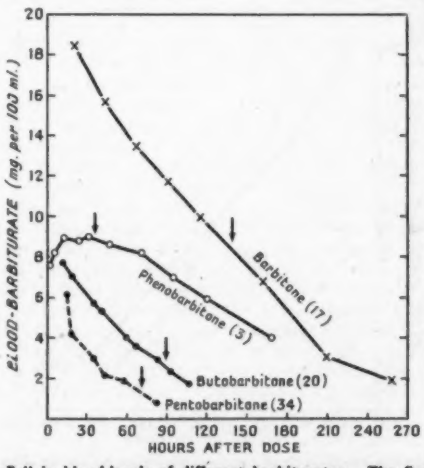

Fig. 1—Fall in blood-levels of different barbiturates. The figures in parentheses indicate the case number, and the arrows the time at which consciousness was regained.

The blood-barbiturate levels of 23 patients at their return to consciousness are given in table III. The mean levels are 7 mg. (±2 mg.) per 100 ml. for the long-acting, 3 mg. (±1 mg.) per 100 ml. for the intermediate, and 1–2 mg. per 100 ml. for the short-acting barbiturates. These conclusions are also illustrated by fig. 1 and table II.

Effect of Picrotoxin

Treatment of these patients varied considerably. Picrotoxin was the analeptic most commonly used, but this did not appear to influence the rate of fall of blood-barbiturate levels. Table III suggests that patients who were treated with picrotoxin regained consciousness at blood-levels slightly higher than those of other patients who had taken the same drug, but the data are insufficient for statistical analysis. In 2 cases of phenobarbitone poisoning (nos. 2 and 3) the blood-levels, and their rates of fall, were similar; case 2 was unconscious for 82 hours and his blood-level was 7·3 mg. per 100 ml. when he regained consciousness, but case 3 was treated with picrotoxin, was unconscious for only 36 hours, and his blood-level was 8·9 mg. per 100 ml. when he regained consciousness.

Gastric Contents

Quantitative analyses of gastric contents and washings were made in 21 patients. The volumes of these contents were variable and the barbiturate levels ranged from 1 to 1500 mg. per 100 ml. The total amount of barbiturate removed by gastric lavage was 0·1–119 mg., and it was the equivalent of less than 4% of the dose in the 6 cases in which data were complete. When this treatment was given more than 12 hours after the dose the total amount of barbiturate removed was insignificant, irrespective of the dose.

Urine

Single specimens of urine from many of these cases were also analysed. Except in 1 case (no. 16—see below), the highest barbiturate level found was 42 mg. barbitone per 100 ml. 71 hours after the dose (case 18). In most cases of phenobarbitone poisoning the level in urine was less than 10 mg. per 100 ml., but no correlation between urine levels and the degree of unconsciousness could be detected.

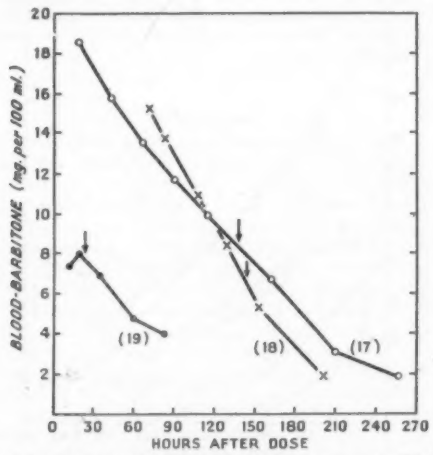

Fig. 2—Fall in blood-levels of 3 cases of barbitone poisoning. The figures in parentheses indicate the case number, and the arrows the time at which consciousness was regained.

Case-records

A Typical Case (no. 20)

A man, aged 27, was found unconscious, having taken an overdose of butobarbitone the previous evening. His progress in hospital is illustrated in fig. 4. He was given a stomach washout on admission, but this yielded a negligible amount of barbiturate. He passed no urine in the first 40 hours, but after intravenous therapy, including noradrenaline, he excreted 0·5 g. butobarbitone in 15 hours. At the end of the 2nd day he showed no sign of returning consciousness, and since his chest condition was causing anxiety he was given picrotoxin. This produced no change in the rate of fall of the blood-butobarbitone level. He recovered consciousness 90 hours after the dose, when the blood-level was 2·5 mg. butobarbitone per 100 ml.

An Exceptional Case (no. 16)

A woman, aged 67, was found unconscious, having taken not less than 22 g. barbitone 12 hours previously. Respiration failed on the journey to hospital, and was re-started by manual artificial respiration. On admission to hospital all reflexes were absent, and the blood-pressure was 90/50 mm. Hg. She was given nikethamide (' Coramine ') and oxygen, and gastric lavage was performed. Later respiration again failed, and, after tracheotomy, was maintained by an intermittent positive-pressure apparatus. The blood-pressure was maintained by an intravenous infusion of noradrenaline. Bemegride (' Megimide ') in doses of 50 mg. intravenously was given to a total of 1 g., without apparent effect. Tube feeding, intermittent positive pressure, and noradrenaline infusion were continued until the patient died, 96 hours after admission. Necropsy showed that death was due to pulmonary œdema and pneumonia.

Barbiturate estimations of this patient are given in table IV.

PATIENTS FOUND DEAD

Barbiturate levels of specimens taken from the 10 patients found dead are shown in table V. In only 2 cases (58 and 59) were the blood-barbiturate levels significantly higher than those of surviving patients who had taken the same drug (table II). The C.S.F. levels were lower than those of blood, and, in general, only small amounts of barbiturate were found in urine, liver, and kidney. Stomach and intestinal contents usually contained large amounts of barbiturate, contrasting strongly with the amount recovered by stomach washout from the surviving patients.

TABLE III—BLOOD-BARBITURATE LEVELS AT RETURN OF CONSCIOUSNESS

Barbiturate	Case no.	Picrotoxin i.v. (mg.)	Blood-barbiturate at return of consciousness (mg. per 100 ml.)	Mean blood-barbiturate (mg. per 100 ml.)
Phenobarbitone ..	1	Nil	7·9	
	2	Nil	7·3	
	3	18	8·9	6·8
	5	Nil	6·0	
	6	Nil	5·6	
	7	Nil	5·0	
Barbitone	17	++	7·8	
	18	++	6·9	7·5
	19	1·5	7·7	
Butobarbitone ..	20	120	2·6	
	21	Nil	2·6	2·3
	22	Nil	1·7	
Amylobarbitone ..	24	++	4·2	
	25	447	3·5	
	26	12	3·3	
	27	Nil	2·3	2·9
	28	Nil	2·4	
	29	Nil	2·5	
	30	Nil	2·4	
Tuinal	32	Nil	1·7	..
Cyclobarbitone ..	33	Nil	1·7	..
Pentobarbitone ..	34	260	1·3	1·3
	35	24	1·3	

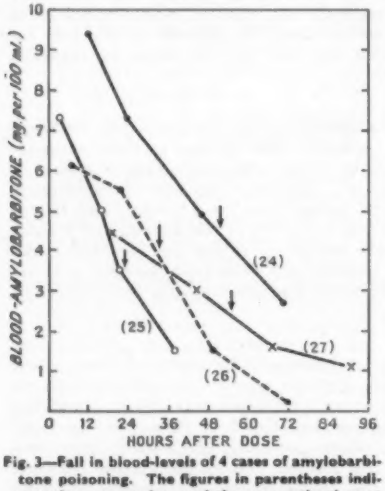

Fig. 3—Fall in blood-levels of 4 cases of amylobarbitone poisoning. The figures in parentheses indicate the case number, and the arrows the time at which consciousness was regained.

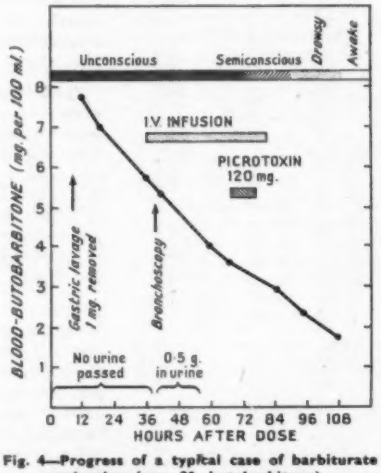

Fig. 4—Progress of a typical case of barbiturate poisoning (case 20, butobarbitone).

Discussion

The reaction of barbiturates with cobaltous salts (Koppanyi et al. 1934) is widely used as a qualitative test in cases of suspected poisoning, but it is relatively insensitive and may not be specific (Riley et al. 1940). The test is usually applied to urine or gastric contents. These specimens may be unreliable guides to the presence of barbiturate in the body and to the severity of the poisoning and, furthermore, are not always available from unconscious patients.

TABLE IV—BARBITURATE ESTIMATIONS IN BARBITONE POISONING (CASE 16)

Hr. after dose	Blood-barbitone (mg. per 100 ml.)	Urine		
		Volume (ml.)	Barbitone content (mg. per 100 ml.)	Barbitone excretion (mg.)
13	41·1	..	..	..
16½	45·3	..	..	..
22	49·5	..	..	..
27	..	700	73	510
35	53·9	110	137	151
43	..	140	108	151
52	..	550	66	362
60	45·6	360	74	266
67	..	350	74	259
75	..	240	90	216
83	35·0	360	83	298
91	..	560	96	537
99	..	270	129	348
107	27·9	290	117	339
108	Died	..	..	..
			Total	3·43 g.

Ultraviolet spectrophotometric analysis of blood is a rapid and reliable test for the presence of barbiturate, but the significance of a blood estimation depends on the type of barbiturate ingested. The long-acting barbiturates are mostly excreted in the urine unchanged (Lous 1954a), and this is reflected in the relatively slow rate of fall of blood-levels. The short-acting barbiturates are metabolised more rapidly and undergo not only oxidation of their alkyl side chains, but also fission of the pyrimidine ring (Maynert 1952a, b, and c). This is reflected in the more rapid fall of blood-barbiturate levels. Those metabolites with an intact pyrimidine ring give positive results with cobalt salts and with most ultraviolet spectrophotometric tests (Maynert 1952c).

When the barbiturate has been identified, or at least classified, the blood-level is a good index of the severity of the poisoning, and may be used to distinguish between medicinal and toxic doses.

Lous (1954b) reported that patients given phenobarbitone in doses of up to 400 mg. per day had blood-levels of up to 6 mg. per 100 ml. Other workers (Fisher et al. 1948, Goldbaum 1948, Lauritzen 1952, Lous 1954a) have reported blood-barbiturate levels of 0·4–4 mg. per 100 ml. after medicinal doses, the long-acting drugs producing higher blood-levels than the short-acting ones.

In acute barbiturate poisoning blood-levels are usually much higher than those found after medicinal doses. Several workers (Fisher et al. 1948, Goldbaum 1948, Helldorf et al. 1949, Nillson 1951, Kyle et al. 1953, Wright and Johns 1953, Lous 1954c, Sunshine and Hackett 1954, Wright 1955) have reported blood-levels after acute poisoning; but since different analytical methods were used, and results were often expressed as the unnamed barbiturate or as the acid or sodium salt, such figures may not be comparable. From the results given in the present paper it is concluded that blood-levels of 9 mg. per 100 ml. of long-acting, 6 mg. per 100 ml. of intermediate, and 4 mg. per 100 ml. of short-acting barbiturates indicate severe poisoning. These figures, and those at which patients return to consciousness, accord with those of other workers, and are of practical value in that it is now possible to assess the prognosis of an unconscious patient, to have some objective measure of the depth of unconsciousness, and to observe the effect of treatment on the blood-level. With the data given in this paper useful predictions of the time of return of consciousness can often be made, but it must be remembered that patients may show individual variations or develop tolerance to the drug after prolonged dosage.

Blood-barbiturate levels previously reported by other workers in fatal cases vary widely (table VI). In some instances this may be due to the presence of other drugs. Fisher (1949) suggested that alcohol may exert a synergistic effect, and from our results (cases 55 and 59) it is possible that salicylate and paraldehyde have a similar action. When assessing fatal blood-barbiturate levels it is essential to distinguish between patients found dead, and those who died later in hospital, when complications, such as pneumonia or uræmia, may have developed. Published reports suggest that the majority of patients who had ingested fatal doses of the long-acting barbiturates died in hospital, whereas those who had taken short-acting ones were more often found dead. It will be observed from table VI that blood-barbiturate levels of some patients who recovered were higher than those of patients who died. For example, our case 16 remained alive for 4 days with a blood-level higher than that previously recorded for any living patient. It is therefore apparent that the fatal blood-level of a given barbiturate cannot be stated; but we may conclude that the following blood-levels are compatible with death from barbiturate poisoning:

Long-acting barbiturates: more than 10 mg. per 100 ml.
Intermediate-acting barbiturates: more than 7 mg. per 100 ml.
Short-acting barbiturates: more than 3 mg. per 100 ml.

We agree, however, with Fisher (1949) that the finding of these blood-levels does not constitute prima-facie evidence of death from barbiturate poisoning.

TABLE VI—REPORTED BLOOD-BARBITURATE LEVELS

Barbiturate	Blood-barbiturate (mg. per 100 ml.)		
	Found dead	Died in hospital	Recovered (highest figures)
Phenobarbitone	8	9–40	21 (Lous 1954c)
Barbitone ..	..	10–53	20·6 (Fisher et al. 1948)
Butobarbitone	1–7	..	7·7 (this investigation)
Amylobarbitone	3–17	1–2·5	8·6 (Sunshine and Hackett 1954)
Tuinal	..	4	5·0 (this investigation)
Cyclobarbitone	12	..	4·5 (this investigation)
Quinalbarbitone	2–7	..	5·0 (Sunshine and Hackett 1954)
Pentobarbitone	1–58	..	6·1 (this investigation)

TABLE V—BARBITURATE LEVELS IN NECROPSY MATERIAL

Case no.	Age (yr.)	Ingested	Blood	C.S.F.	Urine	Kidney	Liver	Stomach contents	Intestinal contents	Notes
			mg. per 100 ml.			mg. per 100 g.		Total (g.)		
51	64	Phenobarbitone	..	..	Tr.*	..	..	6·1*	Tr.*	Found dead
52	..	Butobarbitone	..	..	22*	Tr.*	Tr.*	Nil*	0·02*	Found dead
53	50	Amylobarbitone	6·8	~1	+	+	16	3·1	0·57	Found dead
54	45	Amylobarbitone	7·8	..	..	..	..	0·88*	0·16*	Found dead
55	65	Amylobarbitone + salicylate	>2·5	..	20	+	5·2	+*	Nil*	Stomach washout 1 hr. before death. Salicylate present in urine post mortem
56	42	Tuinal	4·9	2·8	5·6	10·1	12·2	0·07	0·37	Found dead
57	48	Quinalbarbitone	..	..	..	21*	2*	0·13*	0·04*	Found dead
58	54	Pentobarbitone	9·0	~5	9·7	..	98	←——17·5——→		Died 4 hr. after dose
59	39	Pentobarbitone	24·1	3·3	2·2	..	..	0·34	0·71	Found dead
60	60	1·8 g. pentobarbitone + 340 ml. paraldehyde	0·9	0·3	Nil	Nil	Nil	0·43	..	Found dead. Blood-paraldehyde 36 mg. per 100 ml.

*Figures obtained by weighing after Stas-Otto extraction, and barbiturate detected by the reaction with cobalt salts. The remaining results were obtained by spectrophotometric methods.

Determinations of barbiturate in tissues reported by other workers (Andrew and Neubauer 1947, Goldbaum 1948, Copeman 1954, Wright 1954) and in this paper are poor indications of the severity of the poisoning. It is noteworthy, however, that the stomach and intestines of fatal cases often contain large amounts of barbiturate, and that this may indicate a rapidly rising blood-level at the time of death.

Summary

The value of the determination of blood-barbiturate levels in cases of acute poisoning has been shown. Qualitative tests for barbiturate in urine and gastric contents may be misleading.

The levels of barbiturate in blood and other materials have been determined in 36 cases of acute poisoning. Patients returned to consciousness with blood-levels of 5–9 mg. per 100 ml. of long-acting, 1·7–4·2 mg. per 100 ml. of intermediate, and 1–2 mg. per 100 ml. of short-acting barbiturates. Useful predictions of the time of return to consciousness can often be made.

Picrotoxin therapy appeared to result in an earlier return to consciousness in some patients.

The difference in blood-levels of patients on medicinal doses of barbiturates, and of those with acute poisoning, is discussed.

Analyses of necropsy material from 10 persons found dead after ingestion of barbiturates are reported, and fatal blood-levels are discussed.

We thank Dr. A. M. Cooke, Dr. F. G. Hobson, Dr. P. C. Mallam, and Prof. L. J. Witts for permission to study their patients and for access to case-notes.

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"... People have known for a long time that food sometimes goes bad, and that children sometimes go wrong; but, whereas they found out long ago that the way to keep the food sweet is to keep it in a cool place, they still entertain the most varied and often unsuccessful ideas about how to keep the children straight. Bacteriology can now explain fairly exactly what happens when food goes bad, while psychology can tell us only a little about some of the things which can happen to make children go wrong; but that little is of immense value, because it is much harder to guess or find out what to do about the children than what to do about the food; and psychology has in fact disclosed errors in the care of children far more gross than anyone was making in the care of food. But this knowledge is much harder to apply. Engineers can make us a machine which will dispense coolness in the larder but no one will ever make us a machine which will dispense love and security in the home. We have to do that for ourselves."—Sir GEOFFREY VICKERS, v.c., *Listener*, Jan. 12, 1956, p. 44.

ADRENALECTOMY AND THE METABOLIC RESPONSE TO INJURY

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THE normal complex metabolic response to injury is modified by removal of the adrenal glands, but the administration of cortisone enables the totally adrenalectomised or hypophysectomised patient to react to injury with a metabolic response which in some respects resembles that of a healthy person with intact adrenals and hypophysis.

In a patient maintained on a constant daily dose of cortisone 200 mg. after removal of the second adrenal gland Robson et al. (1955) found increased urinary excretion of nitrogen and potassium and decreased urinary excretion of sodium, as in postoperative patients with intact adrenal glands (Wilkinson et al. 1949, 1950), and concluded that this response was not due to increased secretion by the adrenal cortex.

Mason (1955) found that patients undergoing total hypophysectomy or adrenalectomy and maintained with a constant daily dose of 80 mg. of either corticotrophin or cortisone also exhibited a similar metabolic response to that found in postoperative patients with intact adrenals. He concluded that the postoperative metabolic changes do not depend solely on adrenal cortical activity.

Neither of these reports includes a study of another operation preceding that of total adrenalectomy in the same patient. Therefore I report here, in a patient with recurrent carcinoma, the metabolic response following bilateral ovariotomy and removal of one adrenal gland and, later, the removal of the remaining adrenal gland.

Methods

Urine was collected in six-hour specimens; urinary sodium and potassium levels were measured with a flame photometer, and nitrogen by the micro-kjeldahl method. No attempt was made to maintain a constant intake of sodium or of potassium; the free consumption by the patient of food and drink was recorded, and the sodium, potassium, and nitrogen contents were then calculated from the tables of McCance and Widdowson (1946). Fæces were not analysed. The data for sodium, potassium, and nitrogen are shown in the accompanying figure according to the method of Reifenstein et al. (1945). Intake is plotted down from the base-line and output is then plotted up from the intake line. The area above the base-line represents excess of output over intake (negative balance); a clear area below the base-line indicates an excess of intake over output (positive balance).

Case-report

In 1946 a married woman, aged 53, developed a left mammary carcinoma, which was treated by radical mastectomy. Her chest wall and axilla were subsequently treated with X rays in February, 1947, and again in July, 1947, after a nodule had appeared in the operation site. She remained well until 1952, when she noticed in the operation site another swelling, which in June, 1953, was treated by further radiotherapy and with testosterone. In March, 1954, the skin in the treated area became ulcerated and infected.

On admission on Sept. 6, 1954, her general condition was good, and the ulcer on her chest wall was 3 inches in diameter and involved the ribs and intercostal muscles. There were no bony or glandular metastases.

Operations.—Laparotomy, bilateral ovariotomy, and left adrenalectomy were done on Sept. 10, 1954, and right adrenalectomy on Sept. 29, 1954.

Postoperative course.—During and after the first operation there was much fluctuation in blood-pressure, but after the second operation the blood-pressure was much less disturbed. Noradrenaline was administered by slow intravenous infusion

from nineteen to seventy hours after the second operation. The administration of cortisone was started three days before the second operation (the dosage is shown in the figure). The right adrenal gland weighed 4·5 g. and the left 3·5 g.; on histological examination both appeared normal, and malignant tissue was not found in either gland. At first the patient made satisfactory progress; the mammary ulcer began to diminish, and within three weeks of the second operation she was getting out of bed.

Terminal course.—Pressure necrosis in both buttocks and necrosis of the skin of the left calf over the internal saphenous vein subsequently led to sloughing of the skin and infection. The ulcer on the chest wall began to increase in size and depth, and the patient died of bacterial toxæmia six weeks after the second operation.

Necropsy findings.—The carcinoma was confined to the chest wall, and the histological appearance of this tumour still closely resembled that of the original specimen—an anaplastic adenocarcinoma with much necrosis.

Intake of Food and Fluid

The patient was encouraged to consume as much food and fluid as she could but was not given a constant intake of either food or minerals; the intakes of protein and calories were deficient throughout the period of study, the daily nitrogen intake seldom exceeding 4 g. The intake of potassium was consistently larger than that of sodium, but both were less than the normal minimum. The intravenous administration of fluid was limited after the first operation to a short infusion of 5% glucose solution as long as there was anxiety about maintaining the blood-pressure. After the second operation an infusion of 5% glucose solution was maintained for ninety hours to allow of the administration of noradrenaline and was supplemented by 900 ml. of 0·9% saline solution.

Findings in Urine

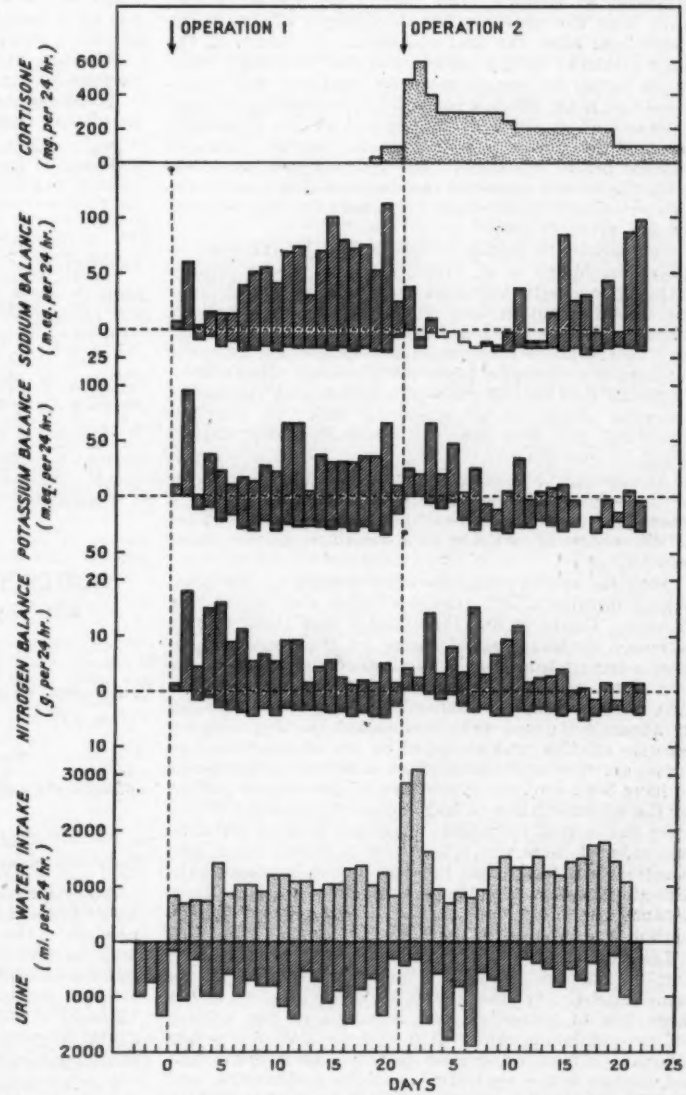
Volume.—During the first ten days after the first operation the water intake was equal to the volume of urine, but in the second ten days exceeded the volume of urine by 2·0 litres; after the second operation the water intake exceeded the volume of urine by 5 litres in the first ten days and by 9·2 litres in the second ten days. During the first two days after the second operation the water intake was 5·4 litres but the volume of urine only 760 ml. Over the next five days the water intake was 4·96 litres and the volume of urine 6·41 litres. Thus, after a delay of forty-eight hours, there was a large maintained diuresis while the daily dosage of cortisone was 300 mg. or more.

Specific gravity.—After the first operation the specific gravity of the urine remained steadily above 1·018 for three days and thereafter fell below this in only a few six-hour periods—a response which was similar to, but less severe than, that which is usual after operations such as partial gastrectomy (my unpublished observations). After the second operation the specific gravity of the urine fell below 1·012 on the third day and remained below this level for six days and then rose and remained at or above 1·016 from the ninth to the sixteenth day, when it again fell below 1·012.

Composition.—The changes in composition of the urine (see figure) indicate that, although the metabolic responses to the two operations were in some respects similar, there were also striking differences. The total loss of nitrogen was only about half as great after the second operation, and of potassium only a quarter as great, as after the first operation. The large negative balance of sodium during the first ten days after the first operation gave place to a small positive balance over the same period after the second operation. Sodium conservation after the first operation was within the range to be expected after such an operation, but the later urinary loss of sodium was unexpectedly large. After the second operation the sodium conservation was almost complete for thirteen days. The potassium-sodium ratio of the urine was inverted after both operations; but, whereas it reached a peak of only 1·6 on the second day and was inverted for six days after the first operation, so complete was sodium conservation after the second operation that there was a peak of 50 on the fifth day and the ratio was inverted for thirteen days.

Discussion

After total adrenalectomy in animals a normal response to injury appears to depend on the administration of a sufficient quantity of adrenal cortical hormone. Ingle et al. (1947) showed that, in adrenalectomised rats, after fracture of a tibia the increased urinary excretion of nitrogen, indicating increased katabolism of tissue protein depended on the administration of adrenal



Metabolic responses to operations. (Intake of water and output of urine are not expressed as a balance.)

cortical extract and did not occur in rats maintained with 1% saline solution only.

Campbell et al. (1953), who also used the urinary excretion of nitrogen as an index of the metabolic response to injury in rats, found that a similar increase in urinary nitrogen followed both fracture of a femur and implantation of cortisone acetate 25 mg., and that a further and similar increase followed both the implantation of cortisone acetate 50 mg. and the combination of fracture of a femur with the implantation of cortisone acetate 25 mg. In the present patient the second surgical trauma was less severe than the first, but it was expected that this would be amply compensated by the large dosage of cortisone; it is very surprising that after the second operation the nitrogen and potassium in the urine were respectively only half and a quarter as much as after the first operation.

Since this patient was very ill with recurrent malignant disease, an important factor in reducing the urinary excretion of nitrogen after the second operation may have been the previous loss of nitrogen due to tissue katabolism after the first operation. In addition, the daily intake of dietary protein was low for at least three weeks before the second operation, and it is well recognised that many of these patients are in negative nitrogen balance and depleted of protein; 4 of the 5 patients reported by Mason (1955) were in negative nitrogen balance before operation. The reduced potassium loss after the second operation can be related in part to the smaller tissue katabolism indicated by the reduced urinary nitrogen loss.

Comparing the metabolic effects of bilateral splanchnicectomy Moore et al. (1955) found a smaller urinary nitrogen loss with increased sodium conservation after the second operation than after the first; their patient, however, did not suffer a large loss of sodium after the first operation. I made a similar observation after the resuture of a disrupted laparotomy wound. Moore et al. suggested that the difference in response after the second operation might be a continuing effect of the first operation, and they discounted any likelihood that it might be due to adrenal "exhaustion" or insufficiency. In the present patient the apparently abnormal response to the second operation may be the normal result of a second operation after a short interval and thus evidence of the success of cortisone as a substitute for the whole adrenal.

After the second operation water loading by the intravenous infusion of 5% glucose solution was followed by diuresis. Gaunt et al. (1949) found that there was an increased reabsorption of water by the renal tubules after adrenalectomy and a diminished diuretic response to a water load. Mirsky et al. (1954) showed, however, that the increased antidiuretic activity of the plasma in adrenalectomised rats, maintained on 1% sodium-chloride solution, was abolished by the administration of cortisone. The antidiuretic effect of adrenalectomy seems to have been similarly diminished in the present patient by the administration of large doses of cortisone. Later, after the second operation, when the dose of cortisone was reduced there was a tendency to retain water, and it seems more likely that this was due to increased antidiuretic activity than to sodium conservation, since, because of the low daily intake of sodium, only a little sodium was retained in the body.

Llaurado (1954) concluded that a "sodium-retaining" and "potassium-excreting" factor is excreted in the urine immediately after operation, concomitantly with a large loss of potassium and inversion of the urinary sodium-potassium ratio. Although he did not isolate aldosterone from urine after operation he suggests that aldosterone is the electrolyte-controlling substance, and that an increased production of aldosterone is part of the normal endocrinological response to injury. Evidence from only one patient must be viewed with the greatest caution, yet the intense conservation of sodium after adrenalectomy with large maintenance doses of cortisone suggests that either large doses of cortisone may have powerful sodium-retaining activity or aldosterone may be produced elsewhere than in the adrenals. Further comparison between the two stages of bilateral ovariotomy and bilateral adrenalectomy, with varied dosage of cortisone after the removal of the second adrenal, and with similar doses of cortisone after both operations, is clearly desirable and is being undertaken.

Summary

The metabolic responses of a woman with recurrent carcinoma of the breast to bilateral ovariotomy and removal of one adrenal and to the removal of the remaining adrenal, although basically similar, showed large differences in degree.

The urinary nitrogen and potassium were respectively only half and a quarter as great after the second as after the first operation, but sodium conservation was more complete and prolonged after the second operation.

After adrenalectomy cortisone restores the ability to respond by diuresis to a large water load.

These results indicate a need for caution in the interpretation of metabolic studies after adrenalectomy.

I am indebted to Sister Duguid and her staff for the collection of the urine and measurement of food and fluid intakes, and to Miss Edna Simpson and Mr. Gordon Shewan for their assistance in the analysis of the urines.

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ACUTE TUBULAR NECROSIS OF THE KIDNEY FOLLOWING ABORTION

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ABORTION procured by intra-uterine douching with soapy water is one of the common causes of acute tubular necrosis of the kidney. The factors bringing this about may be severe shock, infection (particularly with *Clostridium welchii*), and the circulation and renal excretion of heme pigments formed by hæmolysis. The following 13 cases of abortion anuria were seen at the Hammersmith Hospital between 1947 and 1952, when we were studying anuria (Bull et al. 1949, 1950).

7 of the patients admitted that intra-uterine douching had been carried out either by themselves or by other persons. 1 patient had had a therapeutic abortion in a nursing-home by

the insertion of a soap paste into the cervix; and another patient, a trained nurse, had passed an instrument into her uterus. The other 4 patients refused to disclose details of their abortions.

Case-reports

Case 1.—A woman, aged 38, gave herself a vaginal douche in the 4th month of pregnancy, 14 days before admission to Hammersmith Hospital on Oct. 15, 1947. Vaginal bleeding, vomiting, and oliguria developed, but she had no medical attention until admission, when the products of conception were passed spontaneously. She had passed a very small quantity of dark urine for several days after the onset of vaginal bleeding.

On admission she was pale and drowsy and was vomiting. She was already in the early diuretic phase of acute tubular necrosis, passing large quantities of dilute urine.

Treatment and progress.—She was given an oral Borst diet and her water and salt balances were maintained. She made a satisfactory recovery and was in good health 2 years later, although she had diminished renal function and mild hypertension.

Case 2.—A widow, a trained nurse aged 27, passed an instrument into her uterus on March 25, 1948, and aborted that day. She was admitted to hospital next day because of anuria and jaundice. She was given penicillin on account of fever, and intravenous feeding. She was transferred to Hammersmith Hospital on April 1.

On admission she was pale but not jaundiced; she had facial œdema and epistaxis and she was vomiting. She had a raised venous pressure and a collapsing pulse. There were basal crepitations in both lungs.

Treatment and progress.—The patient was given a protein-free diet, water and salt balance, and blood-transfusion. She was treated twice by dialysis with an artificial kidney, but she died from pyæmia on April 9.

Necropsy showed acute tubular necrosis of both proximal and distal tubules with eosinophil casts in the distal tubules. Acute endometritis and multiple pulmonary abscesses were also present.

Case 3.—A woman, aged 27, aborted on April 12, 1948, when 22 weeks pregnant; details of the abortion were not disclosed. She had been anuric from the time of the abortion, and had been admitted to hospital, where she was treated with forced fluids, potassium citrate, and intravenous sodium sulphate. On April 16 she was given a high spinal anæsthetic, and the next day her right kidney was decapsulated. On April 18 she was transferred to Hammersmith Hospital.

On admission she was pale and drowsy, and had a high venous pressure in her neck and œdema of her legs. She was treated with an oral Borst diet, water and salt balance, and dialysis (artificial kidney) on the 8th and 13th days of illness. She made a good recovery.

Case 4.—A woman, aged 24, gave herself an intra-uterine douche of soapy water on Aug. 28, 1948, with the immediate onset of shock, vomiting, and abdominal pain. She was admitted to hospital that day and delivered of an immature fœtus. She was given intravenous fluids and penicillin, and on Aug. 30 high spinal anæsthesia was induced.

She was transferred to Hammersmith Hospital on Aug. 31 and an intragastric drip-feeding régime (Bull et al. 1949) was instituted. She was severely ill in the early diuretic phase, but she eventually made a good recovery.

Case 5.—A woman, aged 20, had a criminal abortion on Oct. 20, 1948, and was subsequently admitted to hospital with uterine sepsis, peritonitis, and anuria. She had blood-transfusion, intravenous fluids, and gastric suction. Uræmic fits developed on Oct. 26, and she was transferred to Hammersmith Hospital three days later.

On admission she was comatose, acidotic, grossly œdematous, and moribund. She died that day before dialysis could be performed.

Necropsy showed acute tubular necrosis of the kidneys.

Case 6.—A woman, aged 27, gave herself a douche of soapy water on Nov. 23, 1948. Within 24 hours she aborted and became oliguric and began vomiting, but she was not admitted to hospital until Dec. 1, when she was given a blood-transfusion for anæmia and kept in salt and water balance. She was transferred to Hammersmith Hospital three days later, when the intragastric drip-feeding régime was started; this was continued for 19 days. Although she was severely ill on admission, she made a good recovery.

Case 7.—A girl, aged 16, gave herself an intra-uterine douche of soapy water on Nov. 30, 1948. She was admitted to hospital that day, and her uterus was evacuated and penicillin given. Blood-transfusion for anæmia was started after several days of anuria, and she was treated with forced fluids and mercurial diuretics without effect. She was transferred to Hammersmith Hospital on Dec. 9, when intragastric drip-feeding was started; this was continued for 13 days. She made a satisfactory recovery.

Case 8.—A girl, aged 17, had an intra-uterine douche of soapy water, and was admitted to hospital the following day with pelvic peritonitis and anuria. There was spontaneous delivery of the fœtus, and the placenta was removed digitally. Blood-transfusion was given, and the intragastric drip-feeding régime started. She had a spontaneous diuresis with fall of blood-urea level to 80 mg. per 100 ml. and evidence of recovery of tubular function, but on the 12th day of her illness she showed signs of generalised peritonitis, and she died on the 15th day.

Necropsy showed acute tubular necrosis of the kidneys.

Case 9.—A married woman, aged 37, pregnant for the 5th time, gave herself an intra-uterine douche with soapy water and 'Dettol' on June 18, 1950. This was followed by vaginal bleeding, backache, headache, and vomiting. She was admitted to hospital on June 27 as a case of incomplete septic abortion. On July 3 she underwent dilatation and curettage, and blood-transfusion was given for anæmia (Hb 48%). On July 7 she became drowsy and began having epileptic fits; she had passed urine only about once daily for the previous few days. Her blood-pressure was 176/112 mm. Hg and blood-urea 515 mg. per 100 ml. During the next few days she received intragastric drip-feeding with sugar, fat, and water only; no allowance was made for electrolyte loss in the urine although her diuresis was steadily increasing. She entered a second phase of oliguria and finally became anuric; there was another rise in the blood-urea level, and a fall in blood-pressure due to sodium depletion. She was transferred to Hammersmith Hospital on July 15.

On examination she was pale and had dry, inelastic skin and a dry tongue. Pulse-rate 120 per min.; blood-pressure 80/65 mm. Hg; jugular venous pressure not raised; positive Chvostek's sign; right septic parotitis. She had general muscular weakness and was slow in thought and action but rational. The plasma specific gravity was high (1·035), but it fell to normal (1·027) when she was given intravenous sodium chloride and sodium lactate with glucose. When the sodium depletion had been corrected, her blood-pressure began to rise and her blood-urea to fall, and she began to pass more urine. After this temporary improvement potassium depletion developed on July 20, with tremor, muscular weakness, and finally coma; serum-potassium level fell from 5·1 to 2·8 m.eq. per litre, and the characteristic electrocardiographic changes were present. Despite intravenous potassium therapy she died on July 21.

Necropsy showed acute tubular necrosis.

Case 10.—A woman, aged 32, had an abortion on Aug. 18, 1950, but she did not disclose the method used. She was admitted to hospital that day and spontaneous delivery of the fœtus followed with manual removal of the placenta. Blood-transfusion was given for shock. She was oliguric from the time of the abortion. She was transferred to Hammersmith Hospital in the late diuretic phase, and the intragastric drip-feeding régime was instituted. She made a good recovery.

Case 11.—A woman, aged 21, aborted on Oct. 20, 1951, by a method not disclosed. She was admitted to hospital, but because of anuria was transferred to Hammersmith Hospital next day. Intragastric drip-feeding was started, but owing to continued vomiting this was changed to intravenous infusion of 20% glucose solution by 'Polythene' tubing into the superior vena cava. She made a good recovery.

Case 12.—A woman of unknown age was first seen in a nursing-home where a therapeutic abortion had been carried

DURATION OF OLIGURIA AND DAY OF ONSET OF DIURESIS

Case no.	Oliguria * (days)	Diuresis † (day)	Blood-urea		Outcome
			Highest level (mg. per 100 ml.)	Day of illness	
1	?	?	514	14	Recovered
2	12	14	400	12	Died
3	12	15	299	19	Recovered
4	13	18	482	18	"
5	10	..	520	10	Died
6	20	24	508	22	Recovered
7	13	15	364	14	"
8	?	9	396	8	Died
9	?	..	672	26	"
10	9	12	340	14	Recovered
11	11	15	384	18	"
12	10	12	?	..	"
13	15	..	560	17	Died

* Urinary output of less than 300 ml. per day.
† Urinary output of 1 litre or more per day.

out by the insertion into the cervix of a commercial preparation containing medicated soap. Severe abdominal pain and shock developed, and subsequently oliguria and signs of pelvic peritonitis. The intragastric drip-feeding régime was instituted. No laboratory data were obtained. The pelvic peritonitis was controlled by large doses of antibiotics, and she made a good recovery. During convalescence mild right-sided uveitis developed which responded to cortisone.

Case 13.—A woman, aged 26, gave herself an intra-uterine douche of soapy water on Dec. 3, 1948. This was followed by vaginal bleeding, vomiting, and oliguria. She was admitted to hospital on Dec. 12, and her uterus was evacuated the next day.

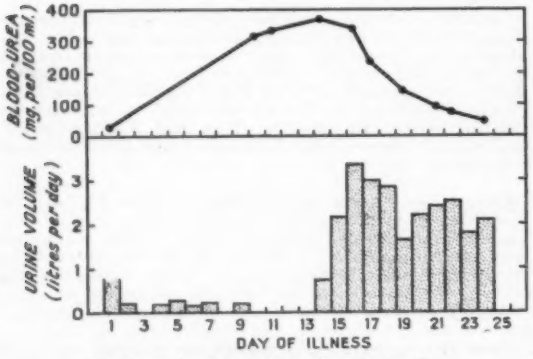
Treatment and progress.—Initially she was treated by large amounts of intravenous fluids and by lumbar splanchnic blocks. She then showed signs of fluid overloading and uræmia, and intragastric drip-feeding was begun on Dec. 14. We saw her on Dec. 16 when diuresis was starting; the urinary output on Dec. 18 was 500 ml. Pulmonary œdema supervened, and she died on Dec. 19.

Necropsy showed acute tubular necrosis.

Discussion

Early Treatment

The patient should be admitted to hospital as soon as possible and emergency treatment of shock instituted. We saw no patient at the onset of her illness; there were delays varying from a few hours to as much as 14 days before admission to hospital, and there were further delays before the patients were seen by us. 4 patients had blood-transfusions on admission for shock, but none had signs of a hæmolytic transfusion reaction. Only 1 patient, who did not have a transfusion, had "bloody" urine at the onset of renal failure. Several patients were thought to be jaundiced on admission but no supporting laboratory evidence is available. In some patients (for example, case 7) shock was severe and prolonged; but in others (cases 1 and 6) renal failure developed insidiously, and there were delays of several days before their admission to hospital.



Blood-urea level and urine volume in case 7.

Infection

Infection of the genital tract, peritonitis, and septicæmia are considerable hazards and may require careful treatment, particularly with antibiotics. 2 patients had severe infections; these possibly influenced the development of renal failure.

Case 5 had septicæmia due to *Cl. welchii* which was controlled by penicillin and sulphathiazole. When seen by us on the 10th day of her illness she showed signs of gross overloading with fluid; she was in coma and died before dialysis could be performed.

Case 8 died from a flare-up of peritonitis after she had had a diuresis and a fall in her blood-urea level from 396 mg. to 80 mg. per 100 ml. High blood-levels of antibiotics are readily obtained during anuria, because of lack of renal excretion. A fall in blood-antibiotic level, due to diuresis, may have been responsible for death in this case.

Oliguria and Anuria

All patients had anuria or severe oliguria for periods varying from 9 to 20 days and maximal blood-urea levels varying from 299 mg. to 672 mg. per 100 ml. (see accompanying table).

In 5 cases there was necropsy confirmation of acute tubular necrosis, and in the 8 surviving patients the clinical course of the illness and the pattern of renal dysfunction were typical (Bull et al. 1950). The accompanying figure shows the fall in the blood-urea level after the start of diuresis in a 16-year-old girl (case 7) who recovered. Some of the other cases have been described previously (Bull et al. 1949, 1950).

Until 1949 the emphasis in treatment in our unit was on the removal of waste products from the blood and the correction of electrolyte balance by dialysis with an artificial kidney. Cases 2 and 3 had successful dialyses; but case 2 died of pyæmia probably caused by staphylococci introduced during dialysis; these organisms were resistant to the antibiotics then available.

Renal Failure

Criminal abortion is a common cause of acute renal failure according to most workers. Hamburger (1954), reviewing 100 cases of acute tubular nephropathy, noted that 39 were postabortive. Elsewhere abortion seems to have accounted for a smaller proportion of cases of acute renal failure (Swann and Merrill 1953, Brun 1954); but in our experience abortion is as important a cause of renal failure as concealed accidental hæmorrhage of pregnancy, postoperative or traumatic shock, mismatched blood-transfusion, or poisoning by mercury, &c.

The lesion is probably caused by renal ischæmia brought about by blood-loss or the severe pain following uterine douching. In addition, the soap solution probably causes intravascular hæmolysis at the placental site; the resulting heme pigments circulate and form casts in the kidney. Moreover phenol or another nephrotoxic agent may be incorporated in the douche and make the tubular necrosis worse. Quinine used as an abortifacient, and infection with *Cl. welchii*, both cause intravascular hæmolysis and shock and possibly renal failure subsequently, but both these causes are rare in our experience.

Renal failure should be recognised early by the daily volume, specific gravity, and composition of urine, and the blood chemistry. If rational treatment is applied (Bull 1955), renal failure should rarely cause death.

2 patients died from water and electrolyte imbalance. Case 13 was grossly overloaded with fluid early in the

course of illness. Despite the institution of intragastric drip-feeding on the 11th day of her illness and the onset of diuresis on the 16th day, she died from pulmonary œdema. In case 9, renal failure was recognised too late for effective treatment to be applied.

Summary

13 patients had acute renal failure after abortion, procured in most cases by intra-uterine douching with soapy water.

In all patients the clinical features and laboratory data, and in the 5 fatal cases the necropsy findings, were those of acute tubular necrosis.

Of the 5 deaths 3 were due to infection and 2 to water and electrolyte imbalance. Some of these deaths could possibly have been avoided by rational treatment in the early stages.

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MEDIASTINAL SURGICAL EMPHYSEMA DUE TO PERFORATED DUODENAL ULCER

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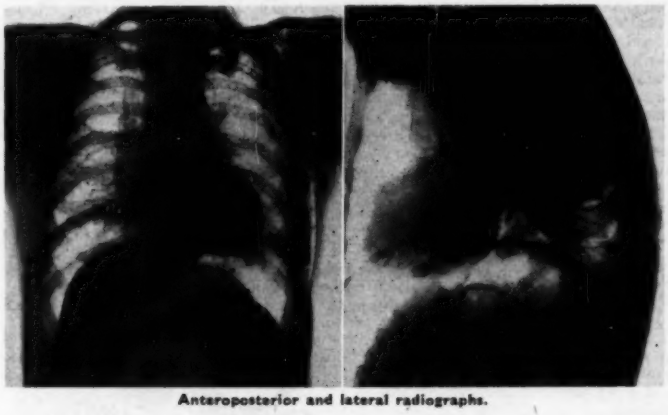
THE unusual case described here presented an interesting problem in diagnosis.

Case-report

A man, aged 72, was admitted to hospital seven hours after the sudden onset of severe upper abdominal pain. Six hours previously he had noticed in the region of the right shoulder pain which rapidly became severe and persisted. He had not vomited. He had long had "digestive troubles" without pain or dysphagia.



Anteroposterior and lateral radiographs.

On examination the patient was dyspnœic, immobile, and ill-looking, with cyanosed extremities. There was a diffuse surgical emphysema extending from the upper half of the chest-wall over the clavicles and suprasternal notch into the neck as far as the angles of the mandible. The pulse was regular and of good volume; blood-pressure 200/100 mm. Hg. Respiration was rapid and shallow; and the upper abdomen was rigid, intensely distended, and grossly tympanitic.

Radiography.—Anteroposterior and lateral radiographs of the chest and upper abdomen showed wide separation of liver from diaphragm, and mediastinal emphysema extending into the tissues of the neck (see figure).

Operation and Progress.—Through a Ryle's tube a large quantity of air was aspirated from the stomach. At laparotomy there was severe distension of the peritoneal cavity, which contained a large quantity of free gastric content. On the anterior surface of the first part of the duodenum was a small perforation about the size of a pin-head. Para-œsophageal herniation of the peritoneum, with intact wall, was present. The perforation was closed and the peritoneal cavity cleared by suction. The wound was closed without drainage. Postoperatively the bowel sounds returned on the second day; the emphysema had appreciably diminished by the third day, and finally disappeared on the twelfth day. During convalescence there was no suggestion of a "post-operative chest" or of mediastinitis. When the patient was seen at follow-up six months later his general condition was good, and he was symptom-free.

Discussion

Sudden, spontaneous epigastric pain with abdominal rigidity, respiratory distress, and subcutaneous emphysema of the neck in an elderly patient is reasonably regarded as pathognomonic of spontaneous rupture of the œsophagus. Yet this is uncommon, especially where there has been no previous evidence of an œsophageal lesion. In the present case there was little reason to assume the presence of a predisposing œsophageal lesion, such as injury, nor was there sudden overdistension by the ingestion of an over-bulky bolus or volume of fluid. A trivial and unsuspected injury, however, may sometimes cause a breach in the mucosa, producing a "dissecting" lesion (Nanson and Milnes Walker 1953). The patient was not shocked. Clinically the likeliest diagnosis was spontaneous rupture of a healthy œsophagus—a disorder diagnosed preoperatively and successfully treated on only a score or so of occasions (most recently in three cases reported by Borrie (1955)).

The clinical findings therefore indicated spontaneous œsophageal rupture; but this was not supported by the history. There were, however, adequate grounds for diagnosing perforated peptic ulcer; and this diagnosis was later substantiated by the radiographic findings.

The association of perforated duodenal ulcer with mediastinal surgical emphysema must be very rare. Mediastinal emphysema is a recognised complication of artificial pneumoperitoneum, but the mechanism is not clear.

In the present case air may have escaped into the mediastinum through a small breach in the thin peritoneum of the hiatus pouch; but this was not evident on cursory palpation. At all events the radiographs demonstrate continuity of the abdominal and thoracic air. The important factor in this case was the extreme tension within the peritoneal cavity and stomach. Gastric contents must have been forced into the lower mediastinum; but this gave rise to no untoward reactions during convalescence.

There is a good case for routine radiographic examination of the chest and upper abdomen in cases of clinically "obvious" perforated peptic ulcer.

I thank Mr. N. E. Stidolph, senior surgeon, Whittington Hospital, under whose care this patient was admitted, for the opportunity of treating and reporting the case.

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SULPHÆMOGLOBINURIA DURING ADMINISTRATION OF STIBOPHEN

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THE accidents which sometimes happen during the treatment of bilharziasis with antimonial compounds, especially stibophen ('Fouadin,' 'Repodral,' 'Fantorin'), cause much concern to those engaged daily in treating the infected population. The sudden collapse, which is nearly always fatal in a few hours, has often been ascribed to sudden heart-failure. We, however, suspected that there must be another factor to explain the sudden onset and the symptoms of shock.

During the past few years we have investigated blood-antimony levels without being able to correlate them with the sudden death; the patients who died had normal amounts of antimony in their organs. Recently the case reported here was associated with hæmoglobinuria and sulphæmoglobinuria. Subsequently we found two more cases of hæmoglobinuria developing during treatment with stibophen.

Case-report

A man, aged 32, and weighing 8 st. 2½ lb., with painful micturition and terminal hæmaturia, had had a course of intravenous tartar emetic five years ago and a course of intramuscular stibophen a year before admission for antibilharzial treatment.

On examination he had nothing abnormal in his heart, chest, or abdomen. His Hb was 65% (Sahli) before treatment. Ova of *Schistosoma hæmatobium* were present in his urine.

Treatment and Collapse.—He was given 3·75 ml. of a 6% solution of stibophen intramuscularly daily for eight days. On the eighth day, at 10.30 A.M. (half an hour after the last injection) he collapsed, with pulse-rate 120 and blood-pressure 130/90 mm. Hg, and soon passed into coma with pulse almost imperceptible. He was deeply cyanosed and had blotchy reddish areas all over his body. His heart was dilated, and a weak systolic murmur was heard over the apex. Coarse crepitations in both bases, with signs of consolidation, were detected. Liver and spleen were palpable. Oxygen inhalation was administered. After an hour the patient regained consciousness and his pulse became palpable. Although his general condition improved, he had convulsions occasionally. At 2 P.M. he was somewhat irritable and wished to urinate but could not do so. Catheterisation produced 150 ml. of port-wine-coloured urine, which contained few red blood-cells and numerous granular casts. Spectroscopy of the urine revealed sulphæmoglobin and oxyhæmoglobin. The patient's pulse-rate was 110 and his temperature 101·3°F. At 3 P.M. he was quiet but felt chilly. He was therefore placed in an electric cradle intermittently. He passed unaided 250 ml. of port-wine-coloured urine, whose condition was unchanged. Next morning he passed 400 ml. of urine, still port-wine-coloured but of a lighter tint. During the day the urine became gradually clearer, approaching the normal amber colour but still containing a brownish sediment of granular casts and traces of sulphæmoglobin and oxyhæmoglobin.

Laboratory Findings.—Hb 40%; red cells 2,820,000 per c.mm.; white cells 21,400 per c.mm. (neutrophils 93%, lymphocytes 7%); cephalin cholesterol flocculation test positive; thymol turbidity 10 units; blood-urea level 80 mg. per 100 ml.; blood-bilirubin level 0·9 mg. per 100 ml. No malaria parasites were found in the blood.

Progress.—On the fourth day the urine still contained albumin and numerous granular casts; it was of low specific gravity (1·008) and sterile on culture. The icterus index was 8 units, and the blood-bilirubin level 0·5 mg. per 100 ml. On the ninth day the urine contained granular casts but no sulphæmoglobin, and the blood contained no malaria parasites and gave a negative Wassermann reaction; and the fragility of the red cells was within normal limits. Radiographically the lungs proved normal except for slight increase in vascular and lymphatic markings. From the fourth day onwards the patient's temperature declined gradually to normal level on the tenth day. After a month his urine contained no casts or urobilinogen, and there was no evidence of sulphæmoglobin or of oxyhæmoglobin; blood-urea level 38 mg. per 100 ml.; cephalin cholesterol flocculation test negative; thymol turbidity 4 units; Hb 80%; red cells 4,216,000 per c.mm.; white cells 8800 per c.mm. (eosinophils 25%, neutrophils 54%, lymphocytes 20%, monocytes 0%, basophils 1%).

Discussion

Although this condition is rare, it is necessary to draw attention to it. It is noteworthy that the patient did not complain of any side-effects until he received the eighth injection. The clinical picture was of severe shock with acute intravascular hæmolysis; in addition a patch of pneumonic consolidation was present—a condition which is known to develop occasionally during antibilharzial treatment and has been ascribed to disintegration of the worms. The urine was characteristic of acute hæmoglobinuria, and on spectroscopy proved to contain sulphæmoglobin and oxyhæmoglobin.

The patient said that for a long time before the injections he had not taken any medicine which could cause this acute sulphæmoglobinuria. The only explanation for this hæmolysis is the possible action of the sulphonic group in the stibophen on a susceptible person. There was also no relation to any of the known hæmoglobinurias, as shown by the laboratory findings. We have also found that stibophen stored for a long time is apt to undergo molecular dissociation and become toxic.

New Inventions

AN INSTRUMENT RACK FOR CASUALTY SURGERY

To accelerate the preparations for casualty suturing and other minor surgical operations, a rack has been designed which will hold the few instruments commonly needed (figs. 1 and 2). If kept filled in the casualty department it can be placed bodily in the steriliser when required for use, and can be lifted out by the handle; this is fixed at the point of balance and is made to fit the end of Cheatle's forceps.

Construction is of one piece of 22 S.W.G. polished stainless-steel sheet, with a handle of ⅛ in. stainless-steel wire, bent and riveted in position. Slots are cut to hold the instruments; those at each side of the rack have spring retainers (part of the single steel sheet) to hold scalpels firmly so that the blades cannot come into contact with other instruments in sterilisation (a too-common cause of blunting).

One end of the rack has slots to hold 2 scalpels, 1 needle-holder, and 2 pairs of dissecting or toothed forceps; while the other has four slots to hold Spencer Wells's or Lane's forceps or scissors, as required. The over-all dimensions of the rack are 10 in. by 4¾ in.

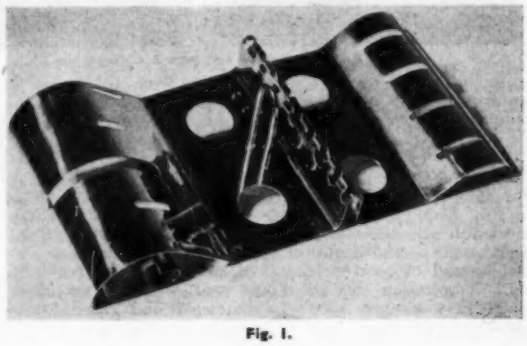


Fig. 1.

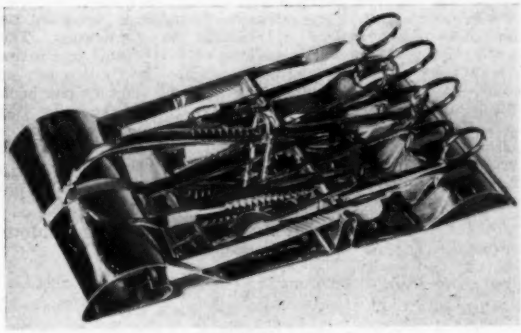


Fig. 2.

In use, it has been found expedient to keep a threaded curved triangular needle fixed in the needle-holder.

I am indebted to Mr. R. E. W. Fisher, of Gillette Industries Ltd., for technical assistance.

Gillette Industries Ltd., Isleworth, Middx — GERALD OLLERENSHAW M.A., B.M. Oxfd

A HEADLIGHT FOR GENERAL SURGERY

IT is necessary in many operations to see deep into narrow spaces. At a certain degree of depth and narrowness this can only be done by means of a light which originates in front of the surgeon's eyes, and coincides fairly closely with his line of sight. This, of course, means a headlight, and after many attempts I have designed one which satisfies me. Its points are:

1. Brilliancy sufficient to compete with the intensity of ordinary main operating-lights, so that there is no need to darken the theatre.

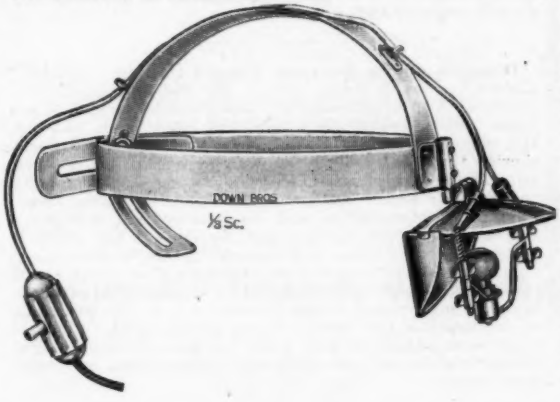
2. An area of illumination intense in the centre, gradually fading out towards the edges. This corresponds to the visual consciousness of the surgeon, and is far better than the clear-cut levelly illuminated field I at first tried for. Any slight irregularities in the field of light will be found quite unnoticeable when working.

3. An approximately parallel beam, which remains without significant change in area or intensity on variations in working distance. This can be attained only by a reflector system.

4. A beam which coincides with the line of sight closely enough for all ordinary surgical work. The slight increase in optical efficiency gained by looking through a hole in the mirror does not compensate for the loss of peripheral vision.

5. A frame to hold the bulb which allows focusing accurately and firm fixation when this is arranged.

6. An attachment to the head which is easily adjusted and which does not depend on that tight grip across the forehead which causes headache. The slight weight of the light is taken by an overhead band loosely held at either end by a circular one.



7. An adjustment for different types of work by a friction joint allowing the only movement necessary —that of up and down in the sagittal plane. (Most headlights have absurdly complicated and varied mountings.) This can easily be adjusted by a non-sterile assistant.

8. A bulb with an opaque-mirror backing over the front two-thirds of the lens. This increases the light sent backwards into the mirror and in addition stops glare getting into assistants' eyes.

9. A shield round the lower part of the mirror to prevent glare into the surgeon's eyes. It is possibly the lack of these last two devices which has caused the non-perforated reflector type of light to be little used.

10. A battery, cheap and of large capacity, specially adapted to the bulb; it is worn on a belt round the waist with an ordinary commercial switch on the flex, so that it can be put into action through the gown. The light can, of course, be run off the main by those who do not object to being tethered by a flex.

The light is made by Messrs. Down Bros. of 32, New Cavendish Street, London, W.1, to whom I am indebted for help in working out many details.

Hospital for Sick Children, Great Ormond Street, London, W.C.1 — DENIS BROWNE F.R.C.S.

Reviews of Books

Breast Cancer and its Diagnosis and Treatment

EDWARD F. LEWISON, M.D., F.A.C.S., assistant professor of surgery, Johns Hopkins University School of Medicine. Baltimore: Williams & Wilkins. London: Baillière, Tindall, & Cox. 1955. Pp. 478. 114s.

IN a foreword, Dr. Grantley Taylor admirably sums up the importance of cancer of the breast to the whole problem of malignant disease. As he points out, our ideas of malignant disease "derive largely from observations of breast cancer"; and "breast cancer was the prototype for the development and perfection of the concept of the radical operation for cancer." The experimental study of heredity in cancer has been chiefly carried out on cancer of the breast in mice. Again, cancer of the breast is one of the few forms of cancer which has so far responded to "therapeutic modifications of the hormonal environment." It is no wonder therefore that many people feel that, if the exceedingly tough shell of the cancer problem is broken at the clinical level, it is likely to be through cancer of the breast.

This book assembles the known facts, with the emphasis on the tradition of surgery, of the Johns Hopkins, and particularly of Halsted. Thus, the first chapter gives an interesting account of the history of breast cancer, the culmination of which is the development of the operation of radical mastectomy by Halsted. And the greater part of the book represents the traditional surgical point of view, given by a surgeon who obviously has extensive knowledge and experience and has given much thought to the practical problems involved.

Dr. Lewison has taken the lion's share of the work, but he has been helped by eight distinguished colleagues. The one British contributor, Mr. R. S. Handley, has written an excellent chapter on the surgical anatomy of the breast, in which he cleverly manages to give a dynamic twist to the subject and to discuss the principles of breast surgery. This is the only part of the book in which the question whether the pectoralis major should be sacrificed in radical mastectomy is discussed: elsewhere this procedure, the main technical contribution of Halsted to breast-cancer surgery, is unquestioningly accepted. The book makes no reference to the classical article by Gray on the lymphatics of the breast, which undermines the traditional pathological arguments in favour of routine removal of the pectoralis major.

There is a very detailed account of "classical" radical mastectomy, but in the chapter on hormonal treatment only a bare mention (without any technical operative details) of adrenalectomy, and no discussion of the possible ways of destroying the pituitary influence. Diagnostic manœuvres are fully described, and the importance of biopsy is properly stressed. The author rightly notes that palpation of the breast should be carried out with the pulps of the fingers.

Many English books still advise that the breasts should be palpated with the flat of the hand, though this advice stems from a wrong translation of Velpeau's French.

The book can be read as a whole, and not just as an encyclopædia. It may not give the reader a very original point of view, but it achieves its object of summarising the main facts and the important questions about breast cancer, as an experienced surgeon sees them.

The Boke of Chyldren

THOMAS PHAIRE. Edited by Prof. A. V. NEALE, F.R.C.P., and H. R. E. WALLIS, M.D. Edinburgh: E. & S. Livingstone. 1955. Pp. 76. 7*s*. 6*d*.

PUBLISHED in 1545, this was the first book on pædiatrics ever written by an Englishman and one of the earliest medical books to be published in the English language. At that time the world was beginning to emerge from the darkness of the Middle Ages: printing had been invented a hundred years before; and Vesalius's *Fabrica* had just appeared; but books written by Avicenna and Galen were still in everyday use.

Phaire was born about 1510 probably in Norwich. He went to Oxford to study medicine and to Lincoln's Inn to study law. He started to practise medicine about 1540 and took his M.B. and doctorate at Oxford twenty years later. He was also a solicitor and Member of Parliament. He lived in Kilgerran in Pembrokeshire and died there in 1560.

This is an exact copy of the first edition with the original spelling.

"The gut called of the latines rectum intestinum, falleth out at the foundament, and cannot be gotten in agayne without peine and labour." "Of smal pockes & measilles. . . . The best and most sure helpe in this case is not to meddle with anye kynde of medicines, but to let nature work her operacion." Phaire says that the cause of ulceration of the head is from sides of bacon or salt beef falling from the hooks in the ceiling. (Then, as now, accidents at work and in the home were important.) The author's credo is "Here to doo them good that haue most nede, that is to saye children."

The editors and publishers have earned our thanks by reprinting this book of quaintness and charm.

Somme de médecine contemporaine

Vol. III. *La thérapeutique*. Editors: Prof. ANDRÉ LEMAIRE, Prof. GREGORIO MARAÑÓN, Prof. JEAN LA BARRE, Prof. ARVID WALLGREN. Nice: Les Éditions Médicales. 1955. Pp. 390.

THIS is the third volume of the Contemporary Medicine series, prepared under the direction of the late René Leriche, which will be completed by a fourth volume on Medicine in Modern Life. In a foreword, Prof. André Lemaire puts the case for more international "pooling" of methods of treatment, but he condemns those periods of "inflation" which he thinks all active treatments pass through.

The early chapters on general subjects include a short but interesting history of therapeutics by Prof. Jean La Barre. The rest of the book is divided according to the different systems of the body or different forms of treatment, ranging from phytotherapy to stomatology. Curiously enough there is little mention of radiotherapy or radioactive isotopes. There is no index except for a list of authors with a short "bio-bibliography" of each and a list of names quoted in the text.

Social Casework in Marital Problems

The Development of a Psycho-dynamic Approach. A Study by a Group of Caseworkers. London: Tavistock Publications. 1955. Pp. 199. 15*s*.

THIS is an account by six caseworkers of the origins, development, and working of the Family Discussion Bureau, which is a child of the Family Welfare Organisation Society and the Tavistock Clinic.

The Bureau is rather like the Marriage Guidance Council—but with a difference. Its caseworkers are not counsellors or advisers but have had some training in the school of analytic psychology, and have analytically trained psychiatrists immediately available for consultation. They endeavour to work out with marriage partners in difficulties the nature, psychological content, and origins of their emotional disharmonies. If both partners are willing, each has his or her own caseworker, and the situation revealed is discussed by the caseworkers and a psychiatrist in conference. The expectation is that many interviews will be needed in a given case, though occasionally much good springs from a few or even a single interview when the troubled partner has been able to clear his own mind by talking to a receptive but uninvolved listener, who neither adjudicates nor takes sides.

Cases, both short and long, are used to illustrate the various problems, their working out, and the measure of success achieved. Some attempt is made to assess statistically the results of five years' development and work.

The material is presented with modesty and candour and makes interesting and instructive reading.

Operative Dental Surgery

7th ed. J. B. PARFITT, M.R.C.S., F.D.S.R.C.S., consulting dental surgeon, Guy's Hospital; W. E. HERBERT, M.R.C.S., F.D.S.R.C.S., professor of dental surgery in the University of London at the hospital. London: Edward Arnold. 1955. Pp. 524. 45*s*.

BASED on lectures delivered at Guy's Hospital by Mr. Parfitt, this book first appeared just over thirty years ago. Its scope, which was to give a concise account of the technical procedures of dental surgery with enough theoretical background to explain the underlying principles, has remained unaltered; and there is no other English book which covers precisely the same range of subjects.

The chapters on filling materials and cavity preparation are good, but that on the uses of gutta-percha seems redundant in the present day, and a fuller account of the auto-polymerising acrylic resins would be welcome. Crown and bridgework are dealt with adequately for all but the specialist. An excellent discussion of the pulpless tooth and "focal sepsis" will interest both doctors and dentists called upon to decide whether or not dead teeth should be retained. The ætiology of dental caries is oversimplified and there is no account of some of the more recent work on this controversial and perplexing subject.

The chapter on local anæsthesia is somewhat disappointing; considerable space is devoted to obtundents, which are recognised to be of limited value, and the detailed account of the preparation of procaine solutions in the surgery could well give place to further information about lignocaine. More space, too, could have been given to discussing the advantages and disadvantages of the now almost ubiquitous "cartridge" syringe, especially since it is in regular use by the students at the authors' own hospital. Mercurochrome is advocated as an oral antiseptic; but the general opinion is that aqueous solutions are useless, and solutions in alcohol or in acetone are no more nor less effective than the solvents alone.

Most of the many illustrations really help to clarify points in the text; and the radiographs are reasonably well reproduced, with the exception of that showing the normal mouth.

Another edition of this valuable book will undoubtedly be called for fairly soon, and the opportunity could perhaps be taken to remove those parts of the text that are becoming of less immediate interest to students and dental surgeons today.

Diseases of the Nervous System (5th ed. London: Oxford University Press. 1955. Pp. 996. 55*s*.).—To the students' chagrin, successive editions of textbooks tend to get bigger; but, despite the addition of much fresh material, the new edition of Sir Russell Brain's book is a few pages shorter than its predecessors. There is new material on cervical spondylosis, the Coxsackie viruses, inclusion-body encephalitis, acute hæmorrhagic leucoencephalitis, toxoplasmosis, polymyositis, and neuropathy and myopathy associated with carcinoma; and Sir Russell has added a section on consciousness and unconsciousness to the chapter on the psychological aspects of neurology. The treatment of meningitis has been brought up to date with the latest advances in chemotherapy, and recent developments in the treatment of poliomyelitis and lead-poisoning are discussed. Comprehensiveness and clarity have made Sir Russell's book a firm favourite alike with students, with practitioners, and with neurologists.

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**Lancet*, 1954, *i*, 1011

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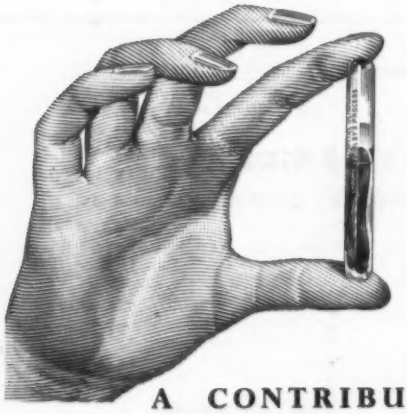

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THE LANCET

LONDON: SATURDAY, JAN. 28, 1956

Restriction of Antibiotics?

AMONG antibiotics, erythromycin has the particular merit that it will often work when others have failed; and from time to time we have urged our readers not to blunt this therapeutic weapon by using it for lesser purposes, but to keep it sheathed unless nothing else will save the patient's life. The advantages of doing this are plain, but so also are the difficulties; and the New Zealand government have decided that on this subject advice to doctors must now be reinforced by restrictions. Because a number of children have died from infections by organisms no longer vulnerable to any antibiotic, they have decreed that, from Feb. 1, New Zealand doctors shall be able to get erythromycin only through hospitals and only for the treatment of diseases which do not respond to other remedies. This announcement by the minister of health, Mr. J. R. HANAN, will arouse interest in many other countries; for, like the ban on heroin, the action now being taken may be regarded as an interference, by a government, with the doctor's freedom to treat his patients in whatever way he chooses.

Looking at it bacteriologically and epidemiologically, there seems everything to be said in favour of the New Zealand decision. When penicillin was first made available to civilian hospitals in 1944, in desperately small quantities, its use as a life-saver was one of the spectacular advances of our time. Those who had the hard task of allotting the scarce supplies will remember the many painful decisions they had to make, and the early days of penicillin were often darkened by the need to refuse; but they were also lightened by the remarkable efficacy of the drug when it was used in the right way in the right cases. In those days of scarcity a few skilled hands achieved excellent results, and there were no mysterious and fatal forms of enteritis and no other complications due to sensitised patients and resistant organisms. Now that antibiotics are plentiful, cannot the benefits of the lean years be restored, without their sufferings, by restricting the use of these substances, by common consent? On purely scientific grounds, it is hard to see why such restriction should not have the desired effect, if it is wisely and firmly applied; for, when an antibiotic is used less widely, the number of bacteria resistant to it diminishes swiftly. If the New Zealand plan is to do what is intended, the hospitals, of course, will have to be even more sparing than the general practitioners in their own use of erythromycin; for it is hospitals, not sickrooms in the home, that are the great sources of antibiotic-resistant organisms. We hope, therefore, that Mr. HANAN has told the hospitals to go very carefully in their own use of erythromycin. Provided this vital point is covered, there are very good reasons for keeping one or more antibiotics in reserve for use in the last resort.

But how exactly should the restriction be secured? Some doctors are notably careful in their prescription of antibiotics, and it may be that the proportion who take thought about this has increased as more and more accounts have been published of the dangers of abusing these agents. But it is still unfortunately true that the habit of giving antibiotics unwisely and even casually is the cause of much avoidable disability to patients; and it would be over-optimistic to suppose that the mere publication of advice is enough to ensure that a drug such as erythromycin is used only when life is in imminent danger. It would no doubt be easy to arrange for a suitably qualified group of doctors to meet from time to time to survey the antibiotics in use and to recommend that one or other should be "rested" long enough to restore its full power; but difficulty might well arise as soon as a move was made to give such recommendations the force of law. It is possible that the kind of restriction now applied in New Zealand would be found acceptable here because its pattern resembles that already adopted for the distribution of important drugs while they are still scarce, and because it does not in fact embody anything like a complete ban. On the other hand, recent happenings have made it seem likely that a regulation on the New Zealand pattern would be resented in this country. Thus, paradoxically, it looks as though a course of action which most doctors would acknowledge to be sound scientifically, and necessary for the good of patients, may be neither voluntarily adopted nor tolerated if imposed. It is evident that, as a profession, we must try to discover means of bringing to bear upon the interests of all patients, whether known to us by name or not, the kind of wise judgment and resolute action which a good doctor prides himself on giving the patient directly in his charge. The New Zealand decision should make us think again about the way in which antibiotics are being used in our own country, and we should also consider from whom, if not from a Government, doctors would accept direction on such subjects.

Sulphonamides and Hypoglycæmia

DURING a clinical trial of the chemotherapeutic action of *p*-amino-benzene-sulphonamido-isopropyl-thiodiazole, JANBON and his associates [1] noted that this substance produces a fall in the blood-sugar level which may be so profound as to lead to hypoglycæmic coma. This clinical observation was confirmed by experimental studies in rabbits and dogs.[2] Oral or subcutaneous administration to dogs results in hypoglycæmia, the blood-sugar falling to as low as 40 mg. per 100 ml. within five hours. With continued administration, chronic hypoglycæmia develops and may cause irreversible neurological changes similar to those observed after prolonged insulin hypoglycæmia. The decrease in blood-sugar is proportional to the concentration of this sulphonamide in the blood; and experimentally, hypoglycæmia is obtained with much lower doses if the sulphonamide is injected directly into an artery supplying the neck of the pancreas. After total removal of the pancreas, there is no hypoglycæmic action, but it persists if as little as a fifth of the gland is left. A study of several thiodiazole

1. Janbon, M., Chaptal, J., Vedel, A., Schaap, J. D. *Montpellier méd.* 1942, **21–22**, 441.
2. Loubatières, A. *C.R. Soc. Biol., Paris*, 1944, **138**, 766.

derivatives was then undertaken.[3–5] Non-sulphonamide thiodiazoles have no hypoglycæmic action, but several compounds of the *p*-amino-benzene-sulphonamido-thiodiazole group lower the blood-sugar in animals. The tertiary butyl and isobutyl derivatives are the most active; then, in decreasing order of activity, follow the butyl, amyl, isoamyl, propyl, and isopropyl derivatives. The ethyl and methyl derivatives are inactive in this respect. Recently another sulphonamide compound, sulphanilyl-*n*-butylurea, has been found to have a similar effect on the blood-sugar level.[6 7] This compound has been more fully investigated in man. After a dose of 2 g. a maximum concentration of free sulphonamide of about 7·5 mg. per 100 ml. of blood is reached in three hours, and there is a considerable fall in the blood-sugar level, which returns to normal in about six hours. The hypoglycæmia can be corrected by giving glucose. With this background information, it was a natural step to ascertain the effect of this substance in diabetic patients.

In one clinical trial [8] sulphanilyl-*n*-butylurea was given to 82 patients with diabetes mellitus of varying duration and severity. The sulphonamide was given after a preliminary period of observation, usually 2·5 g. on the first day, 1·5 g. on the second, and thereafter 1 g. daily. The best results were seen in elderly diabetics. In one group of 28 patients, aged 49 to 77, who had received inadequate or no previous treatment, all but 3 responded well to the drug without the addition of insulin. The glycosuria, by which about 100 g. of sugar had been lost daily, disappeared within a few days and at the same time the blood-sugar fell from fasting values of above 300 mg. to less than 150 mg. per 100 ml. and remained below 200 mg. throughout the day. The renal threshold for glucose did not change. Treatment with sulphonamide was substituted in a second group of 38 patients, aged 41 to 77, who had been previously stabilised on insulin. In 28 it was possible to continue treatment without any insulin. The most favourable results were seen in those with diabetes of recent onset: the response was less satisfactory if previous treatment with insulin had been given for more than a year or two. Further observations in the older patients show that the drug acts gradually and has a long-lasting effect. It is suggested that either intermittent massive therapy or long-continued treatment with small maintenance doses should be given. There is no evidence of the development of tolerance. Fewer observations have been reported in younger diabetics,[6 8] and the results have not been so successful, even where higher doses were given. In most of the younger patients the drug had little effect on blood-sugar levels, but in a few it enabled the dose of insulin to be reduced. In the presence of acidosis there was a poor response, and the substance is clearly unsuitable for use in emergencies. Apart from occasional skin rashes few undesirable side-effects have been reported. As the sulphonamide in its acetylated form is relatively soluble in an acid pH range, there is little danger of crystalluria.

The way in which these compounds work arouses much interest. LOUBATIÈRES [2 3 5] originally suggested that the β-cells of the islets of Langerhans are stimulated to secrete insulin—a view compatible with the complete lack of action after total pancreatectomy. More recently, evidence has been produced that the primary action is on the α-cells, which are thought to be the site of production of the hyperglycæmic polypeptide known as glucagon.[9] Histological studies in the dog, rat, and rabbit have shown that the α-cells are damaged or destroyed after administration of these sulphonamides [10]; and in one diabetic patient who had received this treatment and who died in uræmic coma, no α-cells were found in the pancreas examined immediately after death.[6] Glucagon is considered by some to play a part in the normal regulation of the blood-sugar level and to act in some respects as an antagonist of insulin. In alloxan diabetes the β-cells are damaged but the hyperglycæmia can be controlled by administration of either *p*-amino-benzene-sulphonamido-thiodiazole or sulphanilyl-*n*-butylurea,[5 7] which destroys the α-cells and presumably thus restores the equilibrium. LOUBATIÈRES and his colleagues [11] now suggest that the sulphonamide not only damages the α-cells but also stimulates the formation of new β-cells. But CHEN et al.,[12] investigating the action of a closely allied compound, sulphanilamido-cyclopropylthiazole, found that in normal rabbits it consistently caused hypoglycæmia, although in alloxan-diabetic rabbits it produced a conspicuous rise in blood-sugar. With the other compounds, a transient hyperglycæmia has sometimes been noted before the fall in blood-sugar. In human diabetes it has been suggested that insulin sensitivity or resistance may be associated with the activity of the α-cells, but this has not yet been fully established.

So far the evidence is insufficient for any definite conclusion about the pharmacological action of these compounds. They clearly open up a new approach to the study of carbohydrate metabolism and diabetes mellitus. The preliminary reports suggest that they may be useful in the oral treatment of elderly diabetics but not of young or acidotic patients. Further carefully planned clinical trials may determine the place of these sulphonamide compounds in the management of diabetes, and we hope that the trials will be completed before these powerful substances become widely available.

Precocious Immunity

IN the classical sense immunity to an infection or toxin depends upon the presence of circulating antibodies. There are, however, circumstances in which some protection is conferred when the presence of antibodies can be excluded. Interference phenomena of this kind are seen in certain virus diseases. Of course, in the case of some viruses the presence of circulating antibodies can be detected and passive immunity can be transferred by serum from convalescent patients; but in other virus diseases the immunity appears to be due to exclusion effects, and after an initial acute infection a permanent symbiosis

3. Loubatières, A. *Ibid*, p. 830.
4. Bovet, D., Dubost, P. *Ibid*, p. 764.
5. Loubatières, A. *Arch. int. Physiol.* 1946, **54**, 174.
6. Franke, H., Fuchs, J. *Disch. med. Wschr.* 1955, **80**, 1449.
7. Achelis, J. D., Hardebeck, K. *Ibid*, p. 1452.
8. Bertram, F., Benfeldt, E., Otto, H. *Ibid*, p. 1455.
9. de Duve, C. *Lancet*, 1953, ii, 99; Constam, G. R. *Schweiz. med. Wschr.* 1955, **85**, 92.
10. von Holt, C., von Holt, L., Kröner, B., Kühnau, J. *Arch. exp. Path. Pharmakol.* 1955, **224**, 66, 78.
11. Loubatières, A., Bouyard, P., de Lados, C. F. *C.R. Acad. Sci., Paris*, 1955, **241**, 515.
12. Chen, K. K., Anderson, R. C., Maze, N. *Proc. Soc. exp. Biol., N.Y.* 1946, **63**, 483.

is established between virus and host—in other words, a latent infection. Although the body remains infected, there are no symptoms, and future reinfection with the virus, which would normally cause active disease, produces no effect. This state of affairs can be studied readily in the bacterial viruses: when a bacterial culture is attacked by a specifically active virus, some of the bacterial cells are lysed but others survive and are symbiotically infected with the virus, the daughter cells inheriting the infection when the parent cells divide. These symbiotically infected bacteria, or lysogenic strains, are immune to further attack by the same kind of virus although they remain susceptible to other viruses. Some animal viruses have a less specific effect by which infection with one kind of virus protects against attack by another kind. This protection may be due to saturation of vulnerable sites in the body by the first virus so that there is no suitable accommodation for the second intruder. Another suggestion is that sometimes the second virus may be excluded by starvation, because the first has monopolised all the available metabolic activities of the host.

It is becoming clear that immunity not attributable to classical antibodies can also arise in bacterial diseases. Some protection against toxins can be conferred on animals by giving them large doses of toxoid. It may be that specific receptors in the animal body are occupied by the innocuous toxoid so that the toxin is unable to get at these particular sites and hence cannot produce toxic effects. Unlike the more usual immunity due to antibodies this protection develops immediately and disappears quite rapidly. In tetanus it has been shown that the attachment of toxin to brain tissue in vitro may be blocked by previous exposure to toxoid. Further experiments throwing light on the mechanism of this process have been reported recently by DAVIES and WRIGHT.[1] They concluded that the administration of toxoid did not permanently block the effects of toxin, but that there was active competition between toxin and toxoid for hypothetical receptor sites in the body. On the other hand, once the toxin had been fixed to brain tissue the toxoid could exert no protective action. Animals which had been only partially protected from the effects of toxin by the administration of toxoid did not show the usual signs of tetanus, but paralysis developed, as in botulinum intoxication. The cause might be the unmasking of a further component of tetanus toxin, possibly peripheral in its action. There have been doubts about the wisdom of attempting to immunise patients in the so-called negative phase when they have already been exposed to infection. The administration of toxoid or vaccine at this stage might divert the protective mechanisms of the body and neutralise any small amount of antibody present, thus allowing the invader to do its damage untrammelled. On the other hand, if the immunising agent can exert the blocking and interference phenomena revealed by recent work it may be able to protect even when its administration coincides with exposure to infection. Further experience is needed to judge between these views.

The two kinds of protection conferred by vaccines are seen clearly in the case of whooping-cough.[2] After a single intraperitoneal dose of pertussis vaccine in animals, there is first a sudden but transient protection against pertussis. This protection reaches its peak in about ten days and then disappears. EVANS and PERKINS[2] suggested that it might be the result of interference of the type encountered in virus infections, and it is presumably due to saturation of sensitive sites by the dead organisms in the vaccine so that the live bacteria introduced in the infective inoculation are unable to become established and multiply. The second phase of protection—that dependent on the production of antibodies—appears more slowly but lasts much longer. Protective antibodies cannot be detected in the blood after a single injection of vaccine, but a second injection gives rise to detectable antibody. These observations can be applied in testing the potency of pertussis vaccines. Animals are given the vaccine and later challenged with a live virulent culture to find what protection they have. It is necessary to measure the lasting protection conferred by antibody formation and not the temporary interference effect; hence, the challenge dose should be given when the transient interference effect has subsided and the more permanent antibody effect alone remains. With pertussis vaccines, therefore, the challenge dose should be given 30 days after the administration of vaccine and not, as recommended[3] at present, after 14 days, since the protection measured at that stage is produced by the precocious interference.

1. Davies, J. R., Wright, E. A. *Brit. J. exp. Path.* 1955, **36**, 487.
2. Evans, D. G., Perkins, F. T. *Ibid*, p. 391.

Annotations

THE GUILLEBAUD REPORT

CHARGED three years ago with inquiring into the financial aspects of the National Health Service,[4] the Guillebaud Committee has listened patiently to almost everybody who has views on how the service might be improved. Its report, on which so many hopes have been founded, is being published this week after we go to press; but Dr. Abel-Smith's article on the cost of the National Health Service, which appears on p. 198, reviews some very interesting basic evidence collected for the committee under the auspices of the National Institute of Economic and Social Research, which is now produced in book form by Prof. R. M. Titmuss and himself.

ANTENATAL SEXING

IT seems that a reliable method has been discovered of sexing the unborn child. In a letter on p. 202 Dr. James reports that he has found it easy to determine the presence or absence of the sex chromatin in cells of aspirated amniotic fluid; and with reasonable care amniotic fluid can be obtained at any time after the twelfth week.[5] A preliminary report from Israel by Serr et al.[6] has recently recorded the same observation. Since it has been shown that the technique of nuclear sexing can be applied to cells scraped from the surface of squamous mucosæ, oral[7,8] or vaginal,[9] it was certain that the amniotic fluid and its cells would soon be investigated from this point of view. A priori, it might seem unlikely that satisfactory preparations would be obtained, for the skin even of the fœtus yields only non-nucleated squames, and the lining cells of the amniotic

3. *Tech. Rep. Wld Hlth Org.* 1953, no. 61.
4. See *Lancet*, 1953, i, 732, 749.
5. Alvarez, H., Caldeyro Barcia, R. *Surg. Gynec. Obstet.* 1950, **91**, 1.
6. Serr, D. M., Sachs, L., Danon, M. *Bull. Res. Coun. Israel*, 1955, **5B**, 137.
7. Moore, L. K., Barr, M. L. *Lancet*, 1955, ii, 57.
8. Marberger, E., Boccabella, R. A., Nelson, W. O. *Proc. Soc. exp. Biol., N.Y.* 1955, **89**, 488.
9. Carpentier, P. J., Stolte, L. A. M., Visschers, G. P. *Lancet*, 1955, ii, 874.

sac itself are not very helpful. But the fœtal mucosæ, especially apparently that of the vagina, provide sufficient suitable cells.

There have lately been claims for endocrinological methods of antenatal sexing, but none of them seems to have provided an acceptable degree of accuracy. Examination of the amniotic fluid seems to be the answer, and, if the first findings are confirmed, it remains only to decide what scientific use the method has. It could be a great satisfier of curiosity, and a social convenience; but it is very seldom strictly necessary to the health of either mother or child to know the baby's sex in advance. Indeed, it is easy to picture disastrous results, especially when the examination shows that the child is of an unwanted sex. The discovery is of great interest, but its thoughtless use could be very harmful. The same could be said of pregnancy tests, which have sometimes been abused; but no-one would deny the value of these tests, or of the number of new and unexpected observations in related fields to which they have led.

Twins are a complication which is not discussed by Dr. James or by Serr et al.[6] Perhaps the chances of confusion are not great; but the occasional occurrence (not so rare apparently as is generally supposed[10]) of dissimilar twins in one amniotic cavity is a possible trap. The frequency of multiple pregnancies in most animals of economic importance will probably reduce the interest of the method to veterinarians.

Further interesting news of nuclear sexing by non-histological methods is the confirmation from two sources[11,12] of Davidson and Smith's[13] method of sexing blood-films by examination of the polymorphs.

POLYPOSIS OF THE COLON WITH ADDITIONAL FEATURES

MULTIPLE polyposis of the colon has long been known to be due to a dominant mutant gene with nearly 100% penetrance. It has been clearly distinguished from Peutz's syndrome, in which other parts of the gastro-intestinal tract (stomach and small intestine) are involved. Dukes[14] has lately given a good account of English families with multiple polyposis.

A distinct and true breeding variation of the condition, also probably due to a dominant gene, was described in 1954 by Oldfield,[15] in which the polyposis of the colon was associated with multiple sebaceous cysts. But, though only one small family was involved, it is possible, but unlikely, that two separate dominant genes, one for the polyps and one for the cysts, were present and that their association in the same individuals was fortuitous. Another variant was recorded in the United States by Gardner[16] in which in addition to multiple polyposis there were widely distributed epidermoid cysts, fibromas, and osteomas. Here a single dominant gene was clearly responsible. Precisely the same condition has now been found in another family.[17] It is certain, therefore, that here the association is not fortuitous and that a single pleiotropic gene mutation is responsible or, less probable, two or more closely linked gene mutations.

Thus, one condition appears in some families by itself, and apparently the same condition, with further features constantly added, crops up in other families. This situation has a number of parallels: for example, pachyonychia congenita in some families is accompanied by follicular keratosis and xerodermia, in some families by teeth erupted at birth, but no skin changes, and in one family by follicular keratosis, xerodermia, erupted teeth, and sebaceous cysts. Any explanation of this phenomenon must be speculative. It seems unlikely that the resemblance within families and differences between families are due to gene-modifiers, since these would not be constant within families. Research on lower organisms has shown that much the same phenotypic character may be due to a number of mutations of distinct genes which are nevertheless linked. It has been suggested that the genes concerned bring about a chain reaction and that mutation of any of these may result in the same main biochemical dysfunction. But the side-effects of these mutations may well differ and so add different features to the main condition. In other instances mutations having apparently the same main effect may take place on distinct chromosomes and under such circumstances the side-effects might be expected to be even more variable.

EPIDEMIC KERATO-CONJUNCTIVITIS

THE suggestion that epidemic kerato-conjunctivitis was a virus infection was first made by Wright,[1,2] who, in his study of an outbreak in Madras, was able to demonstrate what he called inclusions in corneal epithelial scrapings; and this material could be used to transfer the disease from man to man. Attempts to isolate any infective agent in culture or by transmission experiments in animals were unsuccessful.

In 1941 an epidemic of great economic importance broke out in the shipyard workers of the west coast of the United States and gradually spread through most of the country. Working with the scrapings from one of these patients, Sanders[3] claimed to have isolated a virus by intracerebral passage in mice. This virus could produce the disease in a human volunteer and was neutralised by convalescent serum from patients with the disease. After two or three years the major epidemic wave died down and only sporadic outbreaks were reported; from these the Sanders virus was rarely isolated. It is interesting to note that in many of these sporadic outbreaks the common connection between those infected was a visit to an ophthalmologist for some other condition, and on occasion it seemed that an instrument may have been the means of transfer—for example, all patients infected may have had tonography performed.

During 1951 and 1952 work on the Sanders virus[4,5] made it clear that it was a variant of the St. Louis encephalitis virus; and it was also shown that sera from the local epidemics then occurring no longer neutralised the virus.[6] In contrast to the experiences in the United States, claims to have isolated a virus similar to the Sanders virus have been made in Turkey[7] and Japan.[8] In both cases the virus caused an encephalitis in mice, and Sezer was able to adapt his virus to produce lesions on the chorio-allantoic membrane of the chick embryo.

Despite the isolation of virus by Sanders and others, there was considerable doubt about the importance of these agents in the disease. Recently the condition has been reinvestigated by two groups of workers—Fowle[9] and her colleagues in Canada and Jawetz[10] and his associates in California. Both these groups have succeeded in isolating viruses of the A.P.C. group from their patients. In Canada the virus appeared to be an atypical form of

10. Corner, G. W. *Amer. J. Obstet. Gynec.* 1955, **70**, 933.
11. Riis, P. *Danish med. Bull.* 1955, **2**, 161.
12. Romatowski, H., Tolksdorf, M., Wiedemann, H. R. *Klin. Wschr.* 1955, **37**/**38**, 911.
13. Davidson, W. M., Smith, D. R. *Brit. med. J.* 1954, ii, 6.
14. Dukes, C. F. *Ann. Eug.* 1955, **17**, 1.
15. Oldfield, M. C. *Brit. J. Surg.* 1954, **41**, 534; see *Lancet*, 1954, ii, 643.
16. Gardner, E. J., Richards, R. C. *Amer. J. hum. Genet.* 1953, **5**, 139.
17. Weiner, R. S., Cooper, P. *New Engl. J. Med.* 1955, **253**, 795.

1. Wright, R. E. *Brit. J. Ophthal.* 1930, **14**, 257.
2. Wright, R. E. *Ibid*, p. 596.
3. Sanders, M. *Arch. Ophthal., Chicago*, 1942, **28**, 581.
4. Ruchman, I. *Proc. Soc. exp. Biol., N.Y.* 1951, **78**, 483.
5. Cheever, F. S. *Ibid*, 1951, **77**, 125.
6. Cockburn, T. A. *Amer. J. Ophthal.* 1954, **38**, 476.
7. Sezer, F. N. *Arch. Ophthal., Chicago*, 1953, **49**, 293.
8. Arakawa, S., Ohashi, T., Seki, T. *Yokohama med. Bull.* 1955, **6**, 9.
9. Fowle, A., Cockeram, A., Ormsby, H. L. *Amer. J. Ophthal.* 1955, **40**, 180 (part II).
10. Jawetz, E., Kimura, S., Hanna, L., Coleman, V. R., Thygeson, P., Nicholas, A. *Ibid*, p. 200 (part II).

the type-3 strains which have been shown by Ryan and others [11] to be the cause of pharyngo-conjunctival fever; and Jawetz's strain seems to be a new type which has been called the Trim or type-8 virus. Serological investigation of the type-8 virus [12] showed that 25 cases of epidemic kerato-conjunctivitis occurring between 1951 and 1955 all showed a convalescent serum titre of 1 in 10 or greater, and only 2 of 29 sera from other eye conditions investigated by Jawetz showed such titres.

It seems that there is a definite association between epidemic kerato-conjunctivitis and these A.P.C. viruses; their known resistance to antiseptics might well explain how transmission occurs by instruments used in ophthalmic practice. There is, however, a certain amount of evidence that other agents may also produce the disease; for not only are the viruses isolated by the early workers very different from the A.P.C. group, but there is also a difference in the clinical picture. In the more widespread epidemics seen by Wright and by Sanders there were definite constitutional symptoms, which the later workers do not mention. Thus, it is possible that the condition may have more than one cause, as is borne out by the occasional isolation of herpes-simplex virus from these cases.

PROGRESS IN NUCLEIC-ACID RESEARCH

THE self-duplicating plant viruses, such as tobacco mosaic virus, are chiefly composed of ribonucleoprotein (6% ribonucleic acid [R.N.A.] by weight), and they have therefore proved important tools for the study of protein synthesis. This gives added interest to the report [13] from Stanley's laboratory of the successful splitting of the tobacco mosaic virus into R.N.A. and protein, and the subsequent recombination of the fragments to form active virus. One sample of the virus was treated with dilute sodium carbonate to remove and degrade the nucleic acid, leaving the protein more or less intact, while another sample was treated for a short time with a dilute detergent which degraded the protein but left the R.N.A. intact. Both components were demonstrated to be free of intact virus. If both fragments were brought together in aqueous solution at pH 6 in the proportion of 10 parts protein to 1 part R.N.A. the solution began to take on the opalescent appearance of a solution of virus and could be shown to contain active virus in amounts which steadily increased, reaching a maximum at twenty-four hours. Typical particles of virus could be detected in the solution by electron microscopy, although none appeared to be present in either of the separate components. As earlier work [14] had shown that the virus particle consisted of a strand of R.N.A. surrounded by a helix of protein, the separation of the components had to be achieved without altering the arrangement of the doubtless specific sites on each fragment which bind the two together by salt-like links and by hydrogen bonds. The first crystallisation of an animal-infecting virus (a strain of poliomyelitis virus) was announced at almost the same time from the same laboratory.

Modern views of the function of the cellular nucleic acids, R.N.A. and desoxyribonucleic acid (D.N.A.), tend to associate D.N.A. with the carriers of hereditary features and R.N.A. with morphogenesis and with protein synthesis. But a recent important paper by Mirsky and his associates [15] has shown that D.N.A. may also be directly concerned in protein synthesis. Isolated calf-thymus nuclei were able to incorporate C^{14}-labelled alanine into nuclear proteins, and this ability was progressively reduced to about 15% of the original level by successive destructions of the D.N.A. by desoxyribonuclease. Furthermore, the R.N.A. contained in the nucleolus appeared to be less closely connected with this protein synthesis, since 30% of the R.N.A. present could be removed by ribonuclease treatment without affecting the power to synthesise protein from alanine. The proteins synthesised under these conditions seemed to be those closely associated with both types of nucleic acid and not the simpler histones of low molecular weight.

In general, however, there seems little doubt that protein synthesis is usually more closely connected with R.N.A. than with D.N.A. For example, the only known function of the silk gland (which is very rich in R.N.A.) in the silkworm is to synthesise the protein silk. The same is true for all proliferating tissues and for those cells which secrete enzymes. Embryonic tissue, which is differentiating as well as growing, is also rich in R.N.A. During intense physiological activity unconnected with active protein synthesis (in the heart and kidney, for example), there is no such correlation with R.N.A. content of the organ.

Another recent achievement also concerns R.N.A., although it is possible that the results and techniques may be applicable to D.N.A. in due course. The R.N.A. macromolecule may be considered as a large number of linked mononucleotides, each nucleotide consisting of a heterocyclic base, linked to a sugar, ribose, which bears a phosphoric acid residue (base-ribose-OPO_3H_2). Elimination of water between a sugar hydroxyl group and an –OH of a neighbouring phosphoric-acid residue builds up the macromolecule. The hydrolysis of the macromolecule to single mononucleotides can be accomplished by alkalis or by enzymes (ribonucleases), but until recently the reversal of this reaction had not been accomplished. Ochoa and his colleagues [16] have now found that if an enzyme isolated from *Azotobacter vinelandii* is allowed to act on a solution of a nucleoside diphosphate [base-ribose-O.PO(OH).O.PO(OH).OH], then a macromolecule is formed by elimination of inorganic phosphate. In this way, Ochoa et al. have built up from adenosine diphosphate a poly-adenine nucleotide which had many of the physical and chemical properties of a typical R.N.A. Similarly, starting from a mixture of the diphosphates of the naturally occurring ribonucleosides (base-ribose) they could build up an even closer model of a naturally occurring R.N.A. The applications of this work to chemotherapy (by providing a source of "R.N.A." containing unnatural nucleosides in particular) are exciting. At present, the corresponding diphosphates of the desoxyribonucleosides are not available, but when they are, it will be interesting to see whether the same enzyme, or possibly a hitherto unknown one, will be able to convert these diphosphates into a D.N.A.-like macromolecule. The four naturally occurring bases in R.N.A. have recently all been detected as nucleoside diphosphates in the acid-soluble fractions of animal tissues. The early suggestions that this acid-soluble fraction would provide precursors for nucleic-acid synthesis [17–19] were strengthened by some of the studies of isotope incorporation [20 21]; and they now seem to have been directly confirmed.

PRINTING OF THE LANCET

A DISPUTE in the printing trade is causing difficulty in the production of this and other journals. We hope to continue the distribution of our weekly issue at the usual time, but at present we are subject to certain restrictions. There may also, we regret to say, be delay in the supply of reprints.

11. Ryan, R. W., O'Rourke, J. F., Iser, G. *Arch. Ophthal., Chicago*, 1955, **54**, 211.
12. Jawetz, E., Kimura, S., Nicholas, A., Thygeson, P., Hanna, L. *Science*, 1955, **122**, 1190.
13. *Chem. Engng News*, Nov. 7, 1955, p. 4794.
14. Schramm, G., Schumacher, G., Zillig, W. *Nature, Lond.* 1955, **175**, 549.
15. Allfrey, V. G., Mirsky, A. E., Osawa, S. *Ibid*, 1955, **176**, 1042.
16. Grunberg-Manago, M., Ortiz, P. J., Ochoa, S. *Science*, 1955, **122**, 907.
17. Todd, A. R. *Harvey Lect.* 1951–52, **47**.
18. Brown, G. B. *Cold Spr. Harb. Symp. quant. Biol.* 1948, **13**, 43.
19. Buchanan, J. M. *J. Cell. comp. Physiol.* 1951, **38**, suppl. 1, 143.
20. Marrian, D. H. *Biochim. biophys. Acta*, 1954, **13**, 282.
21. Goldwasser, E. *J. Amer. chem. Soc.* 1955, **77**, 6083.

Special Articles

PRESENT AND FUTURE COSTS OF THE HEALTH SERVICE

The Economic Evidence to the Guillebaud Committee

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IT is hard to recapture nearly three years later the mood of public opinion at the time the Guillebaud Committee was appointed. There were many who believed that the National Health Service, adventurously launched in 1948, would founder on the problem of finance. The big supplementary estimates required for the service in the early years came as a shock to public opinion. There was a widespread impression that the service was "out of control." Some ascribed the sharp increase in cost that was believed to have occurred to the boundless potentialities of medical science. Others were under the impression that the demands of the aged were very much greater than those of younger people and feared the consequences of an ageing population on the bill for medical care. Propelled by these and other forces, the cost was expected to soar relentlessly upward.

These apprehensions, which were expressed in Parliament and outside, received support from the writings of Dr. Ffrangcon Roberts. His book on *The Cost of Health* was widely read and widely quoted. Much of it was based on the experience of one teaching hospital.

It was in this atmosphere that the Guillebaud Committee was appointed "to review the present and prospective cost of the National Health Service; to suggest means, whether by modifications in organization or otherwise, of ensuring the most effective control and efficient use of such Exchequer funds as may be made available; to advise how, in view of the burdens on the Exchequer, a rising charge upon it can be avoided, while providing for the maintenance of an adequate service; and to make recommendations."

Soon after the committee was set up, Mr. Guillebaud asked the National Institute of Economic and Social Research to sponsor the preparation of a memorandum presenting an economic analysis of the costs of the National Health Service. This memorandum, which was published this week in a revised form,[1] is summarised below. Inevitably, conclusions are stated here without all the reservations to which they are subject. And many questions discussed in the book are omitted.

The cost of the National Health Service that emerges from the Government accounts is ambiguous. Costs of many different kinds are added indiscriminately together in these accounts, the purpose of which is to ensure accountability to Parliament rather than to provide a useful record for economic purposes. For example, the accumulation of cash and the purchase of herrings by hospital authorities clearly need separate treatment. And, for certain purposes, higher remuneration awarded in one year for services performed in earlier years should be allocated to the year when the work was done, rather than to the year when payment was made.

The figures which follow are derived from a laborious rearrangement of the official records of expenditure (published and unpublished) by the central Government, hospital authorities, executive committees, and local authorities. Our main concern is with the cost of the National Health Service in terms of current productive resources to public authorities as a group, distinguishing current from capital costs so far as the records permit. Often exact information was not available and we had to rely on estimates which we made in conjunction with the Ministry of Health. The many qualifications to which our figures are subject are set out in the book.

1. The Cost of the National Health Service in England and Wales. By B. ABEL-SMITH and R. M. TITMUSS. London: Cambridge University Press. 27*s.* 6*d.*

Current Cost

The current cost of the National Health Service falling on public authorities was £371½ million in 1949–50. In the subsequent years it rose by roughly £15 million each year, reaching £430½ million in 1953–54. This rise of £59 million was the result of a larger increase (£77 million) in gross costs, offset by a saving of £18 million by new or increased charges to beneficiaries.

The proportion of total national resources (the gross national product) paid for by public authorities *fell* from 3¾% in 1949–50 to 3¼% in 1953–54. Had the proportion of resources devoted to the service in 1953–54 been the same as in 1949–50 the net cost would have been £67 million higher.

During the period under review there was a considerable general rise in prices. We have tried to estimate the effect of price increases on the cost of the Service, recalculating expenditures at constant (1948–49) prices. The current net cost of the service expressed in "real" terms in this way, was only £11 million greater in 1953–54 than in 1949–50. Thus, the net diversion of resources to the National Health Service since 1949–50 has been of relatively insignificant proportions. There was a rise of nearly 2% in population during the period under review. Allowing for this and for changes in the age structure of the population, the cost *per head* at constant prices was almost the same in 1953–54 as in 1949–50.

Trends of expenditure have been very different in different parts of the service. Between 1949–50 and 1953–54 net current expenditure on the hospital services rose by £71 million, and that on local authority services by £11 million, while expenditure on executive council services fell by £24 million. The movement of total health service expenditure thus represented the combined result of these divergent trends, a fact which needs to be taken into account in considering future trends.

A major part of the rise in hospital expenditure was attributable to rising prices (£41½ million of the £71 million increase from 1949–50 to 1953–54), but the rise in the net volume of goods and services purchased (£29½ million at 1948–49 prices) was also substantial. The increase in labour services as a whole accounts for three-quarters of the increase in resources used in the hospital service at constant prices. The categories of staff which increased most were nurses and domestic staff. The transfer of consultants from whole-time to part-time service and the expansion of the domiciliary specialist service contributed to the higher cost of labour services. The major part of the increase in goods purchased by the hospital service was "medical goods" (drugs, dressings, equipment, appliances, &c.). "Non-medical" purchases increased by only £4 million (7%). This increase of 7% was about the same as the increase in average daily occupied beds over the same period.

Against this increase in cost have to be set the quantitative facts that the hospitals did more work for a larger national population; more confinements took place in hospital; more services were rendered to general practitioners; more provision was made for road and industrial accidents; more people were trained and more research was undertaken. All these are quantitative indices of activity; what cannot be assessed is the changing work of the hospital as an agent of humanity.

The different executive council services show different trends in expenditure. While the pharmaceutical service and the general medical service each increased between 1949–50 and 1953–54 by £6 million, expenditure on the dental service fell by £24 million, and that on the ophthalmic service by £13 million. The rise in the cost of the general medical service was almost entirely due to the increased cost per patient-year resulting from the Danckwerts award to general practitioners. The rise

of £6 million in the net cost of the pharmaceutical service resulted from a rise of £12 million in gross expenditure, offset by £6 million in revenue from charges. Increases in quantity, the substitution in prescriptions of proprietary for non-proprietary articles, and the development of new products generally have all played important parts in causing the increase in cost. But as a whole we believe that the information collected about this service is sadly inadequate. It is not possible to record in useful quantitative terms what has happened.

The trends in cost of the dental and ophthalmic services have been similar. In total they declined in cost by £37 million. The charges introduced in 1951 and 1952 raised £10 million and reductions in the rates of payment of dentists saved £13 million. The remaining fall of £14 million was not entirely due to the indirect effects of changes. There is evidence that demand would have declined anyway after the abnormal arrears of needs had been at least partly dealt with.

A major part of the rise in expenditure by local authorities (£7 million of the £11 million increase from 1949–50 to 1953–54) was the result of rising prices. The rise of £4 million in the real volume of goods and services purchased occurred principally in the ambulance, domestic-help, and home-nursing services.

Capital Expenditure

Capital expenditure by the National Health Service (on fixed assets) has been relatively small. About £12 million has been spent each year. As prices of building work and other capital assets have risen substantially over the period, the *real* rate of capital expenditure has progressively declined. The rôle of the health service in national capital formation has been small and declining (from 0·8% to 0·5%). Nearly all the capital expenditure has been devoted to the hospitals. About 10% of expenditure has been on new hospitals and major extension and a further 21% of expenditure has been on ward accommodation. Expenditure on accommodation for staff has accounted for 16% of the total.

The hospital surveys during the 1939–45 war drew attention to the inadequate state of hospital buildings. "Complete demolition" was recommended in a number of cases as some buildings were "unfit for any human habitation." A higher proportion of hospitals required substantial extensions and adaptations. The surveyors wrote of hospital buildings in the North-western area: "considering the high place which England takes in the medical world, perhaps the most striking thing about them is how bad they are." It was generally agreed that the hospitals taken over in 1948 were too small, too numerous, and too old. In fact, approximately 45% of all hospitals were originally erected before 1891.

A high level of hospital building was expected to be achieved under the National Health Service. These hopes have not been fulfilled. The rate of fixed capital expenditure on hospitals has averaged about one-third of the pre-war rate in real terms. At this rate it would take over 200 years to replace our stock of hospitals.

The Hospital Population

The General Register Office generously undertook for us a special tabulation of the 1951 census schedules for all hospitals in England and Wales. This has drawn attention to the importance of demographic and other social factors which influence the demand on hospitals.

Compared with the demands made by single men and women (and, to a lesser extent, the widowed), the proportion of married men and women in hospital, even at the age of 65 and over, is extremely small. Among married men and women, the rise in the proportion in hospital with advancing age is not at all dramatic; it does not reach very high levels even after the age of 75. For all types of hospital, and in proportion to their numbers in the total adult population, the single, widowed, and divorced make about double the demand on hospital accommodation compared with married people. About two-thirds of all the hospital beds in the country occupied by those aged over 65 are taken by the single, widowed, and divorced. The married state appears to be a powerful safeguard against admission to hospital, particularly to mental and "chronic" hospitals.

If this "photograph" of the hospital population taken on one night in 1951 is a representative picture of hospital provision, many interesting questions are raised by it. Is marriage a shield against high morbidity? Is high morbidity a shield against marriage? How far is the hospital service acting as a family substitute for those who are ill equipped with husbands, wives, and children? The existence or otherwise of surviving close relatives seems the most important single social factor governing the amount and distribution by age and sex of demand for hospital care—particularly from older people. This being so, it would follow that the past social structure of the population determines in some measure current demands for hospital care. The low marriage-rates of forty and fifty years ago represent one important factor. A second is the relatively high mortality-rates in the past among married couples in the working classes, which, in addition to the losses caused by the 1914–18 war, led to a higher incidence of broken marriages. One long-run effect of the 1914–18 war which has an obvious bearing on hospital demand today is the present "abnormally" high proportion of elderly widows. A third factor is the decline in family size and the survival into old age of more childless married men and women.

As regards the future, the substantially higher marriage-rate which has now prevailed for several decades and the considerable fall in the proportion of marriages broken by death are two encouraging features. The Government Actuary's estimates of the population of Great Britain in 1979 shows no significant change in the actual number of single people of pensionable age. The much publicised increase in the aged is expected to consist very roughly of two million married persons and of half a million widowed and divorced women, the groups which make much lower demands for inpatient care.

The Future

Changes in the marital state of the population would need to be included in any attempt to estimate the future cost of the National Health Service. Information on this aspect, however, was available only for the hospital service; but we were able to assemble some scattered information on the use made of the National Health Service by different age and sex groups of the population. From this, we calculate that a higher proportion of the cost of the National Health Service is devoted to the medical care of those under 15 (including confinements) than to the medical care of those aged 65 and over.

These estimates of the use of the service by different age and sex groups have been used to calculate approximately the additional future costs arising *solely* out of projected population change taken as an independent, isolated factor. Changes in age structure *by themselves* are calculated to increase the present current cost of the National Health Service by 3½% between 1951–52 and 1971–72. A further increase of 4½% is attributable to the projected rise in the total population of England and Wales (using the official projection figures). In total, therefore, population changes *by themselves* are not likely to do much to the future cost of the Service.

All these conclusions should reassure those who feared a continuous and steep increase in the cost of the National Health Service. The real increase in cost has been negligible in view of changes in the population, and the share of the community's resources used on the Service has been declining. The cost of the National Health Service is clearly, if not severely, under control.

In the case of capital expenditure, the central Government has proved a much sterner master than local authorities and those who directed the voluntary hospitals. The population changes estimated for the next twenty-five years give no cause for concern.

Public Health

POLIOMYELITIS VACCINATION

AT a press conference on Jan. 19, Mr. R. H. Turton, the Minister of Health, announced that a British variant of the Salk vaccine would be ready for local health authorities to use during May and June of this year. Only a limited amount of vaccine would be available, and it would be given free under the National Health Service. Mr. Turton hoped that between 300,000 and 500,000 children would be vaccinated by the end of June. Only children born in the years 1947–54 could be considered for vaccination at present; the scheme was entirely voluntary, and written permission for vaccination from parents or guardians was obligatory. No vaccinations would be given between the end of June and November (the poliomyelitis "danger period"), and those children who could not be vaccinated before the end of June would receive priority when more vaccine had been prepared later in the year. Each child would have two intramuscular injections of 1 ml. of the vaccine with an interval of not less than three weeks between the injections. For the time being, only local health authorities would be given supplies of the vaccine, but, when more became available, general practitioners would be given the opportunity of participating in the scheme.

Mr. Turton said that the British vaccine, which will be the only type used, had been subjected to the most stringent safety tests and was preferable to any made in other countries. Asked whether parents might hesitate to have their children vaccinated because of the cases of poliomyelitis during early trials in the United States, he pointed out that, because of improved safety measures, at least 10 million children in the United States and over 1 million in Canada had since been vaccinated without a single mishap, and he was confident that this knowledge would remove any doubts as to the vaccine's safety.

Prof. S. P. Bedson, F.R.S., chairman of the Safety Committee of the Medical Research Council, said that the British vaccine was prepared from three strains of virus, but the highly virulent type-I (Mahoney) strain of the Salk vaccine had been replaced by one of lesser virulence; it was planned eventually to replace types II and III with milder strains.

Vaccine is being manufactured in the Glaxo and Burroughs Wellcome laboratories. Both laboratories have substituted a less virulent strain for the type I used by Salk; and we understand that the Wellcome vaccine will contain attenuated strains of type II and III virus, as used by Sabin.

A Ministry of Health circular to county councils and county-borough councils says that the councils should explain the proposals to all parents (or guardians) of children of eligible age in their area and ask them to express their willingness in writing to have their children vaccinated. The circular goes on to say that "the selection of children to receive the vaccination from among those whose parents seek it will be made according to a centrally determined plan designed to maintain an even spread throughout the eligible age-groups which will be based on the month of birth. When the national picture can be studied local health authorities will be informed which months in each age-group have been selected and the children whose birthdays are in those months should be vaccinated as and when the vaccine is received by the local health authority."

Influenza in Suffolk

As we briefly reported last week, there has been much influenza-like illness in recent weeks in Suffolk, and influenza-A virus has been identified from 2 cases in Ipswich. A doctor in practice in the area has kindly sent us the following account of his experiences of the epidemic:

"It began in mid-December just as we were in the middle of an epidemic of measles. The illness affected all ages and often involved several members of the household. The incubation period was from 2 to 3 days. The epidemic reached its height in the first week of January and has now practically disappeared.

"The onset was acute with headache, generalised pains in the back and limbs, pyrexia, tachycardia, and, within 24 hours, a cough. In younger patients the cough appeared to be a manifestation of a tracheitis; in the older people the disease often progressed to acute bronchitis and in the very old bronchopneumonia was fairly common. My partners felt that for the bronchopneumonia aureomycin (chlortetracycline) or 'Achromycin' (tetracycline) was the most helpful, but I saw 4 cases in which the response was inadequate and penicillin was successful. In the absence of antibiotic treatment the pyrexia lasted for 2 to 3 days, and by the 4th day most patients were much better; but the cough often persisted for a week or 10 days and longer in those who had bronchitis.

"About 190 cases were seen among about 10,500 patients. Only 1 death was attributable to influenza—in a man of 89 who died within 48 hours of bronchopneumonia. In conjunction with the Public Health Laboratory Service, we are trying to isolate the virus from garglings and to find antibodies in blood taken from the 10th to 21st day after the beginning of the illness.

"On the whole we do not regard this as a big epidemic, and we were rather surprised to learn that the sickness-rate was so high compared with the rest of the country. The epidemic is now tailing off and today (Jan. 19) only 3 new cases were seen."

Before Our Time

A RELIC OF AN 18TH-CENTURY ISOLATION HOSPITAL

FRANCIS W. STEER
F.S.A.
COUNTY ARCHIVIST, EAST AND WEST SUSSEX

IN 1718, on her return from Constantinople, Lady Mary Wortley Montagu began to advocate the practice of inoculation against smallpox. Seven condemned criminals were used as guineapigs in 1721; the success of the experiment led to two members of the royal family being inoculated in the following year. But the idea of inoculation was to begin with "suspected as unnatural and even impious."[1] Bishops and clergy preached against it, though smallpox had been responsible for 1 out of every 14 deaths in London in 1723. From the journals of St. Bartholomew's Hospital[2] we learn that in 1752 "it was resolved that patients taken ill with small-pox be immediately removed into other wards to be kept separate for that purpose"; the wards named Job and Lazarus were aptly selected for these isolation blocks.

Smallpox was common and devastating in the country as well as in towns; and it was a heavy burden on the poor-rate because an outbreak meant expensive nursing charges. After the early experiments with inoculation, the disease slackened, particularly in the country districts, but bills among the papers of the overseers of the poor

1. Trevelyan, G. M. English Social History. London, 1945; p. 344.
2. Moore, N. History of St. Bartholomew's Hospital. London, 1918; vol. 2, p. 370.

for mass treatment often suggest that there were sporadic epidemics. Many parishes still had their pest-house—usually a cottage away from the centre of population—but few of these buildings have survived which can be identified with certainty.

A few weeks ago, I went to see Goosehill Camp at Binderton, a remarkable iron-age earthwork over 400 ft. up on the eastern face of Bow Hill, which rises on the left-hand side of B 2141 from Chichester to South Harting. Goosehill is, no doubt, an archæologist's paradise, but I was much more interested in a delightful little house some 100 ft. further up the hill—in fact, right on the top. This flint cottage has been adapted to suit modern requirements so far as its desolate position will allow, but, by what can only be described as a miracle, two doors in it have survived which tell us a little medical history.

The doors are of deal boards polished with age. One shuts off the staircase from the sitting-room, while the other does duty for the pantry. They are heavily carved with names and dates. The carving is not mere scratching with a pointed instrument: a really sharp tool in experienced hands made the record that in this cottage I EUEN was INOCULATED 10th APRIL 1755 and RACHAEL CAPLIN was INOCULATED THE 5 NOV 1758. These two people were, like Jane Peachey (August, 1753), Miss Mary Day (1755), J. Newman (1758), A. Newman (March 19, 1758), Miss Mary Peachey, Mr. Peachey, Martha Adams, Jane Wyatt, and others, occupants of the pest-house. One gentleman who rejoiced in the unusual name of WHICHER SOUTER is said to have CAME TO BOW HILL 27 OCTOBER 1758, on the same day as Richard Caplin. G. Gas was there as late as 1781 and E. Souter in (?) 1788.

I examined the parish registers of West Dean, where entries for Binderton were made after the Commonwealth.

A Jane Peachey was baptised in March, 1735–36, so that the person of that name at Bow Hill Cottage in 1753 would have been about 17 years old; she appears to have married James Piggot on Nov. 18, 1762, when Mary Peachey (perhaps her sister) was a witness to the ceremony. A Mary Peachey was married to John Eggar on Oct. 23, 1766, and Jacob Newman was a witness to a marriage performed in 1779. A visit to Stoughton, the parish immediately to the west of Binderton, provided evidence about Richard Caplin. Most of the headstones in the churchyard have been used to form a paved walk, but I found three to members of the Caplin family. A search in the parish registers showed a Richard Caplin as baptised on Aug. 3, 1746, died on Dec. 12, and buried on Dec. 14, 1788—facts which corroborated the epitaph on one of the headstones. Richard would have been 12 years and 2 months old if he was the patient who went to Bow Hill in 1758. On the other hand, it may have been his father, also a Richard, who was buried at Stoughton on May 22, 1773.

These are the only links I could discover between parish records and the 19 names which I noted from the doors and their surrounds. One thing I did establish was that the names of none of the 19 people occur in the West Dean or Stoughton burial registers at or about the time of their sojourn at Bow Hill. We may assume, therefore, with some degree of certainty, that the inoculations were successful.

It is unfortunate that no overseers' accounts for Binderton, West Dean, or Stoughton have survived to tell us the cost of administering this 18th-century isolation hospital in the heart of the Sussex countryside; but how many such hospitals have the names of former patients cut into their structure? The man who carves his mark for posterity is invariably dubbed a vandal, but for once we must approve the habit; it has given us a fragment of local history which might otherwise have been lost.

In England Now

A Running Commentary by Peripatetic Correspondents

Jimmy was seven years old and had leukæmia. Christmas was near when his mother and father learned the truth. The tragedy of medicine lay bare: neither compassion nor the faintest glimmer of a last hope could soften the cold truth. "We can do nothing. A few weeks, perhaps; that's all; nothing more. Only a miracle could—"

With treatment, Jimmy gradually improved. On Christmas Day, he sat up in bed surrounded by toys and sweets, and his face shone with soap, joy, and cortisone. Soon his blood was normal and his marrow too; his spleen could no longer be felt, and his once enlarged glands had vanished. And his appetite knew no limits. "That's not the way to eat your dinner!" Sister was heard to cry. "Haven't you got a knife and fork?" Chips, ice-cream, strawberry jam, and 'Tizer' were his favourites, and on this diet he rapidly made up the weight he had lost. The day came when he was ready to go home. His pyjamas and slippers were put in a small suitcase, and, with trousers, pullover, coat, and school cap, he walked slowly through the hospital gates between his mother and father.

That was two years ago. Since then Jimmy has had another Christmas, and two birthdays, two Easters, and five school holidays. He was happy enough before his illness, but each month his parents tried to bring him even more happiness, knowing that it might be his last. Thrice more he walked out through the hospital gates. But the fourth time he was carried by his father, and last week he died.

Philosophers may argue that two years is a fleeting moment in the life of a little boy; that he might have found a greater peace in death two years ago than in two years hence; that a single sorrow borne once is lighter than many borne often. But the light in the eyes of Jimmy and his parents knew nothing of philosophy. We have no regrets.

* * *

I should like to be a nice examiner, but I don't know how. Candidates don't always give fluent and accurate answers in vivas, and they have to be helped along somehow. They don't like this; the bad ones are apt to be suspicious. Of course the examiner can change the subject, but even the dimmest candidate gets increasingly uncomfortable when the eighth topic is reached in seven minutes, and he goes out muttering, "They never gave me time to think about anything." The other extreme is also painful for all concerned: I have met candidates who were apparently willing to be silent *sine die*, but I have never had the nerve to keep quiet after putting one or two questions and see whether silence can be made to last for a whole fifteen minutes. So there is nothing for it but to ease things along on the middle path. Should I tell the candidate when he is wrong? How it demoralises the already nerve-wracked. Should I encourage his ideas? ("The damn swine led me right up the garden path.") I used to think that the only thing that really mattered was to be kind and friendly, and I hope that over the years I have schooled myself to consistent amiability. But now one of my students has come back from an oral examination by an examiner whose graciousness I have always admired. Evidently my student had been off form; some of his inadequacies had been revealed to him, and he was almost in tears about it. "You know, sir, they were so nice about it. That's what I couldn't bear."

* * *

Practice still is rural in the remoter parts of Lincs. True I go round in a car instead of a trap, and I am called by telephone rather than the midnight knock on the postern. But as I go I look for the red flag put out by the hedgeside. It is a signal. A patient at some remote farm has sent down to a road-side neighbour asking us to call. I go along twisting lanes fortunate if there are no gates to be opened and shut. In the boot of the car are my stock mixtures and tablets, my syringes already boiled and ready for use, dressings, and apparatus for hæmoglobinometry and minor surgery.

My visit may be the only live contact these remote folk have with the outside world within a week during the cold winter months. I have learnt that a doctor's job may be varied. On a night call I may find a patient with coronary thrombosis and give morphia. But the house is cold and lonely for the old folk who have no outside help, and the kindling of a blazing fire in the hearth brings the patient almost as much comfort as the injection. At another house an old lady is panting with asthmatic bronchitis. I count out the antispasmodic tablets for her into a saucer, but far more important I supervise the removal of her bed from a bedroom up rickety stairs to the sitting-room on the ground floor. It would be worth calculating the digitalis equivalent of this simple manœuvre to the over-burdened heart. Yet another woman with involutional melancholia sits there immobile day after day. I can do little for her. She has had expert treatment. But one thing she will let me do—cut her nails.

* * *

G.P.s and M.P.s alike can hardly wait for the latest number of *Proscribers' Notes* with its detailed account of the recent brilliant investigation by Prof. T. Cobbleigh and his colleagues [1] at the Widdicombe Research Unit.

These workers injected watery solutions of different antibiotics into a series of patients, and (owing to the near-sightedness of Professor Cobbleigh) also into a grey mare. The mare hastily went A.W.O.L., but all the patients recovered. As water was the only ingredient common to all the injections, the logical inference is that the water was the curative agent.

After the injection, the patients were asked, "How do you feel?"

25% (Group A) replied, "Better."
25% (Group B) replied, "Worse."
25% (Group C) replied, "Don't know."
25% (Group D) replied, "x — — — x x x, you x x!"

He—i.e., group D—was thereupon withdrawn from the series and sent for a Freudian analysis.

When the survivors were confronted with further injections, even a glimpse of the solution in the syringe produced dramatic improvement. For example, group B said that he had originally replied "Worse" only because the needle was getting a bit blunt when it was his turn; and group C acquired such an improvement of insight into the extent of his recovery that he reached the front door of the unit before recapture.

The final percentage figures, confirmed by UNIVAC, random sampling, and extrapolation of skew-curve deviation—due to the bubbles in Professor Cobbleigh's syringe—prove that antibiotics are unnecessary.

This discovery is as timely as it is revolutionary, for, as Professor Cobbleigh emphasised, there is a number of antibiotic addicts in these islands. Indeed a suspected fourth one was reported yesterday, but it was found that he was only collecting the little bottles for his children to play with. In contrast, there are no cases known of addiction to injections of water.

* * *

BALLAD OF SMITHFIELD

Twa butchers sat in Smithfield fair,
Bummaree, O Bummaree!
And there they made their moan so sair,
By the bonnie church of Bartholomew.

There cam a buyer bold and brave,
Intent, it seems, on ways to save.

"Now sell me meat of goodly brand,
And place it safely in my hand."

"O robber false, thy haste now stay,
Thou canst not carry it away.

"Of trusty porters there's five score,
Ignore them and they'll raise a roar."

He's ta'en the meat in his right hand,
And flouted all the porter band.

Foul fa' the hand that takes the meat,
Bummaree, O Bummaree!
And leaves the porters sair to greet,
By the bonnie church of Bartholomew.

1. Pearse, T., Brewer, W., Stewer, J., Gurney, P., Davey, P., Whiddon, D., 'Awke, A., Cobbleigh, T., et al. (1955) *Widdicom. lächerliche eingebildete Entdeckung and Advertiser*, **123**, 45678.

Letters to the Editor

DOMICILIARY CONSULTATION IN PSYCHIATRIC PRACTICE

SIR,—I am glad that Dr. Hopkins now makes it clear (Jan. 14) that admission to hospital was advised in 3 of the 5 schizophrenic patients in his series, though this was achieved in only 1.

His very full reply to my inquiry emphasises two matters of considerable importance: first, the need for agreed clinical criteria that should be fulfilled in order to establish a diagnosis of schizophrenia; and secondly the need for helping people with disabled personalities (whether due to partially remitted schizophrenia, inveterate neurosis, or anomalous deviation of the personality) who are incapable of benefiting by further active treatment, and are not ill enough to require prolonged hospital care but not well enough to stand on their own feet in the community. In such cases the accent is often on social rather than strictly medical methods. The day hospital that Dr. Hopkins mentions is one practical step, certainly in large towns. Another possibility is boarding-out, which for many years was successful in Scotland and on the Continent but has never found much favour in England and Wales, perhaps because the propaganda which might have led to its effective adoption was in some ways imperfect when it was last propounded in the early 1930s.

There is now a third possibility. It is surprising how seldom one sees reference, in this context, to the powers of local authorities under Part III of the National Health Service Act. A fair analogy would be to compare the kind of crippled personalities that we are discussing with ambulant tuberculous patients who can no longer benefit by inpatient treatment. Progressive local authorities make no bones about their duties in respect of such patients, but few of them seem to have taken very active steps about the community care of mentally disabled persons other than ascertained mental defectives. It is not easy to suggest exactly what local authorities might do; but at least it would be a beginning if one or two pilot surveys were made, in representative areas, in order to ascertain the numbers of such persons, the extent of their disabilities, their social circumstances, and the prospects of employing them gainfully under supervision, possibly as registered disabled persons. Such surveys might justify the experimental establishment of one or two small hostels specifically for the use of patients within this group whose domestic circumstances were such that they could not suitably remain in their own homes, though they need not occupy beds in mental hospitals. Such an experiment would be rather differently oriented from the "therapeutic community" type of venture, for it would aim to deal with those who, from the start, have little or no chance of complete rehabilitation.

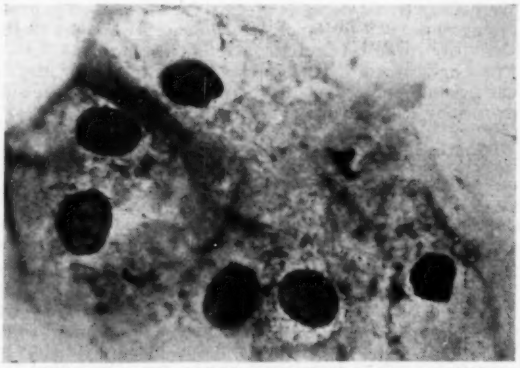
Dr. C. A. H. Watts's [1] survey, to which Dr. Hopkins refers, is valuable and realistic in showing how this problem affects general practitioners as things are at present. But there is more in this problem than clinical attention to individual patients; and I feel sure that general practitioners and psychiatrists together would welcome a more widely informative survey, and, if practicable, more comprehensive help, than any individual can provide.

Warneford Hospital, Oxford. IAN SKOTTOWE.

SEXING FŒTUSES BY EXAMINATION OF AMNIOTIC FLUID

SIR,—Now that the sexing of nuclei has come into the field of exfoliative cytology,[2 3] its applications can be extended further. The sediment of amniotic fluid

1. Watts, C. A. H. *Lancet*, 1954, ii, 85.
2. Moore, L. K., Barr, M. L. *Ibid*, 1955, ii, 57.
3. Carpentier, P. J., Stolte, L. A. M., Visschers, G. P. *Ibid*, p. 874.



Sediment of amniotic fluid. (Papanicolaou stain. × 1100.)

taken at birth contains many cells. With a female fœtus most of these are basophilic with the Papanicolaou staining technique and have large vesicular nuclei. Rosa and Fanard [4 5] demonstrated that they are desquamated cells of the fœtal vaginal epithelium. Moreover, with fœtuses of either sex other cells are found, probably from the digestive and a few from the urinary tract. The material desquamated from the skin consists only of platelets with pyknotic remainders or no nuclei at all.

In the large basophilic cells in the amniotic fluid, where the fœtus is female, sex chromatin can easily be demonstrated (see accompanying figure). We found this in more than half of the nuclei suitable for study of morphological detail. The Papanicolaou and Giemsa stains both give good results. In the case of a male fœtus, most of the nuclei of cells found in the sediment are pyknotic, but some small basophilic cells have vesicular nuclei. No sex chromatin could be found in any of these nuclei.

It is thus possible to diagnose the sex of the fœtus from the sediment of the amniotic fluid by demonstrating the typical nuclear pattern. Where amniotic fluid is tapped for therapeutic reasons the fluid could be tested in this way.

Where the sex of a neonate cannot be established immediately after birth, sexing of nuclei could play an important rôle; by its simplicity and speed cytology is here the method of choice, and Moore and Barr's procedure with smears of the oral mucosa should be preferred in thse cases.

Histological Laboratory,
University of Amsterdam. F. JAMES.

RETIREMENT BENEFITS FOR THE SELF-EMPLOYED

SIR,—Although most members of the medical profession are now accumulating retirement benefits under the National Health Service scheme, there will still be many who cannot make provision so far as earnings from their private practices are concerned; and I am sure that your readers will be as anxious as are other professional people that the proposals of the second Millard Tucker Committee should be implemented in the forthcoming budget.

We all realise that since the war the level of taxation has been so high that very few people are now able to provide for their retirement by setting aside savings out of net income. Employed persons are increasingly able to use pension schemes of one kind or another which enable provision for old age to be made year by year out of gross earnings.

Self-employed persons are not able to enjoy the benefits of such schemes and are thereby placed at a disadvantage compared with those who are employed in industrial or commercial firms which have adopted statutory superannuation schemes. The disadvantage is a very real one which is bound, sooner or later, to have an adverse effect on the independent professions.

The subject has been most carefully reviewed during the past ten years and it is now two years since the Millard Tucker Committee reported. Its conclusion was that the benefits which are available to ordinary employees should apply equally to persons who are self-employed.

These views were shared by the Royal Commission on the Taxation of Profits and Income, and it can be confidently claimed that there is no responsible body of opinion which would continue to deny to the professional self-employed the benefits of pension schemes.

So far as the professional men are concerned the cost would certainly be modest, and in any case would to some extent only represent a deferment, since tax would be payable when the pensions are paid. Since the relief that is given is conditional upon regular saving, the economic effect would not be inflationary.

I hope, therefore, that members of the medical profession will join with their colleagues in other professions in supporting the claim that the Tucker Committee's proposals should speedily find their way on to the Statute Book.

Shortlands, Kent. E. KENNETH WRIGHT.

MENTAL NURSING

SIR,—Recent issues of *The Lancet* have been characterised by an unusual and perhaps laudable emphasis on social and occupational aspects of psychiatry in mental hospitals. Criticism, much of it ill informed, has been directed against such institutions by various individuals who have assumed the authority or right to castigate hospital authorities for a variety of reasons. Hitherto we have dismissed these pontifications with the contempt they deserve. The danger, however, is that the popular press will seize extracts from these pseudo-authoritative pronouncements to entertain their less erudite readers.

Now we are informed by Dr. Hunter (Jan. 14) that over the past twenty years the advances in psychiatric treatment largely comprise cunningly devised methods of restraint put forward under the guise of therapy. Further, the corollary to the proposition, as stated, declares that mental nursing has degenerated to the level of virtually unskilled guardianship; hence the failure of recruitment to the service.

It is difficult to believe that any experienced physician will accept such nonsensical pronouncements. Dr. Hunter's philosophy would suggest that all research in mental disorder should be abandoned and that his skilled team of nurses would thereupon take over. This approach, together with perhaps a short course of psycho-analysis, would at once relegate all physical treatments and all sedation to the limbo. By extension, he would then similarly treat all cases of traumatic delirium and confusional states associated with bacterial infection or toxæmia, still encountered in general hospitals.

May we point out that the most perfunctory inquiry will reveal to Dr. Hunter that practically every general hospital, except teaching units, is bedevilled by a similar acute shortage of nursing staff. Dr. Hunter may or may not have realised that these are times of full employment, that the reserve of both man and woman power is exceedingly small, and that for women greater emancipation and changing economic pressures have thrown open a whole host of vocational possibilities not extant twenty years ago. In this regard the size of the nursing staff is by no means correlated with the amount of physical treatment. Many hospitals in remote areas with comparatively little in the way of newer therapies experience as much difficulty in recruitment as do the others.

We should like to inform him likewise that at the outbreak of war fifteen years ago Springfield Hospital had

4. Rosa, P. A., Fanard, A. E. *Bull. Féd. Gynec. Obstet.* 1949, **1**, 371.
5. Rosa, P. A., Fanard, A. E. *Int. J. Sexol.* February, 1951, p. 1.

its full complement of nurses of both sexes and a waiting-list.

None of us likes empirical treatments. We are not enamoured of electroplexy, insulin, or neurosurgery. Nevertheless, when employed with discrimination in every orthodox mental hospital, these methods produce remissions or recoveries. They are not used for administrative purposes or as methods of restraint. The ever increasing number of open wards, better atmosphere, and vastly increased freedom extant in such hospitals should be apparent to the meanest intelligence or most careless observer.

Finally, no nurse of ours polishes floors. Nurses of both sexes, if asked by Dr. Hunter, will inform him in no uncertain terms that the last two decades have brought them increased dignity, stature, and standing rather than the reverse.

We realise that we still have far to travel in the field of psychiatry, and we feel that its interests would best be subserved by balanced judgments and fewer sweeping assertions on the part of those practitioners in this sphere not immediately connected with mental hospitals.

Dr. Hunter would be well advised to pay a round of visits to representative mental hospitals wherein we are convinced he will find nursing personnel with erudition and dignity equal to his own.

H. C. BECCLE
Physician-superintendent
MORRIS MARKOWE
Deputy Physician-superintendent.
Springfield Hospital,
London, S.W.17.

VENO-OCCLUSIVE DISEASE OF THE LIVER

SIR,—Your annotation on this condition [1] does not refer to our first article [2] in which the histology and pathogenesis—slightly misrepresented in your annotation—were fully described.

Pathology Department,
University College of the West Indies,
Mona St. Andrew, Jamaica.
G. BRAS.

INTRAGASTRIC MILK DRIP IN TREATMENT OF UPPER GASTRO-INTESTINAL HÆMORRHAGE

SIR,—Dr. Dawson, in his article on the continuous intragastric milk drip in the treatment of upper gastro-intestinal hæmorrhage (Jan. 14), makes critical reference to our observations [3] on the value of the indwelling tube in the management of hæmatemesis. Our continued experience of the method, which now extends to 225 patients, has, if anything, increased our confidence in the procedure.

The recognition of further gastric hæmorrhage formed only a small part of the original study of 105 patients; of equal value, and disregarded by Dr. Dawson, has been the information provided as to the site of ulcer by the association of clear aspiration specimens with clinical evidence of continued bleeding, indicating a source of hæmorrhage beyond the pylorus. These factors, in conjunction with the gastric secretory patterns observed during and after the acute stages of gastroduodenal hæmorrhage, led to the correct recognition of the pathological cause of the bleeding in a significant proportion of the patients studied. We suggest that the complete application of the method might have improved the results obtained, our mortality of 4·8% in 225 unselected patients so investigated comparing favourably with Dr. Dawson's series (8 in 100 patients).

We would agree with Dr. Dawson that the reappearance or continuance of blood-staining of the gastric contents does not necessarily herald a further massive hæmorrhage; but its presence gives no grounds for complacency, and, with other criteria, will lead to the earlier recognition and treatment of this complication. We believe that a complete regard for all the points made in our paper can do much to stimulate awareness of the diagnostic problem and to facilitate its earlier solution. From our further experience we see no reason to modify our original conclusion that early gastric aspiration aids materially in the management of hæmatemesis.

Department of Medicine,
University of Leeds.
G. N. CHANDLER
G. WATKINSON.

1 *Lancet*, 1955, ii, 1284.
2. *Arch. Path. (Lab. Med.)* 1954, **57**, 288.
Chandler, G. N., Watkinson, G. *Lancet*, 1953, ii, 1170.

BREAD

SIR,—Professor McCance and Dr. Widdowson concluded their article on Old Thoughts and New Work on Breads White and Brown [1] by saying: "It is of course always quite possible that little attention will be paid to these experiments of ours. . . ." I have just re-read their original report,[2] which confirms the conclusion I first came to that the experiments were vitiated by the fact that no consideration had been given to the possibility that the children suffered from hypothyroidism, and that iodine was the limiting factor in their inability to grow. On seeing these undergrown children it is astonishing that any clinician could have overlooked this, apart from the fact that Duisburg is, I believe, in a goitrous area. The effects of the secretion of the thyroid on protein, fat, carbohydrate, and calcium metabolism, on nerve-muscle function, on reproductive activity, and on resistance to infection are well known.[3]

The following data from these experiments support this contention:

At the start of the studies 5 children at Duisburg and 3 at Vohwinkel had thyroid enlargement; at the end 64 at Duisburg (66%) and 27 at Vohwinkel (50%) had enlarged thyroids. The protein range at Duisburg was 61–73 g., at Vohwinkel 51–53 g., and in both groups the weight increase in the same time was the same, so that it can be seen that the lower Vohwinkel supply of protein was adequate for growth, the excess protein at Duisburg merely going to supply energy and accounting for the increased hypothyroidism in that group. This is the reason why the addition of milk was ineffective owing to the exhaustion of the available iodine and the comment "cannot be improved by a milk supplement" is meaningless.

The delay in epiphyseal ossification is typical of hypothyroidism, quite a different radiological picture to that of rickets. The continued presence of skin infection supports this contention, as does the complete absence of puberty in boys of 14. Amongst British boys puberty may start at 10 or 11 years. Iodine was given, and this in itself should have suggested the nature of the deficiency. The puzzling œdema is due to the unbalanced vitamin supplement added to the 70%-extraction flour and causing a conditioned vitamin-B_1 deficiency. It is said that the children were so ravenous that they cleared every scrap of food and yet gave scraps of food to the monkeys in the zoo. This does not appear to have been allowed for in the tables. One wonders what else the children did?

It can be seen therefore that there are no grounds for Professor McCance's conclusions, as the question of iodine being the limiting factor in failure of growth was not considered, and the internal evidence in the experiments strongly suggests that it was.

"Man cannot live by bread alone." It has never been claimed that man can subsist on wholemeal bread alone, but with other foods it enhances their combined nutritional value. It is astonishing that the claim should be made that the experimental diets were nutritionally adequate, when the subjects of the studies are shown at the end to have enlarged thyroids, skin sepsis, delayed puberty, bad teeth, and delayed epiphyseal ossification—and at an age well below that in which they will be called upon to sustain all the vicissitudes of life.

Winnipeg, Manitoba,
Canada.
E. P. EVANS.

1. McCance, R. A., Widdowson, E. M. *Lancet*, 1955, ii, 205.
2. Widdowson, E. M., McCance, R. A. *Spec. Rep. Ser. med. Res. Coun. Lond.* no. 287. H.M. Stationery Office, 1954.
3. *Physiol. Rev.* 1951, **31**, 205.

"OEDÈME BLEU"

SIR,—Dr. Ida Macalpine and Sir James Paterson Ross (Jan. 14) deem it "impossible to discuss *œdème bleu des hystériques* without glancing at the history of the term 'hysterical.'" They achieve this glimpse and, in addition, aver that the "term has impeded the understanding of mental disorders from earliest times" without mentioning the name of Charcot's great collaborator, Pierre Janet.

The latter's book on *The Major Symptoms of Hysteria* (1907) is a psychiatric classic. Its perusal leaves no room for doubt that the word, as used by Janet, has secured a permanent place in the history of systematic psychotherapy. It has, since his day, been consistently traduced by physicians and surgeons. His description of the malady, however, remains of paramount clinical significance.

London, W.1. MURDO MACKENZIE.

RECRUITMENT FOR THE OVERSEA MEDICAL SERVICE

SIR,—From personal experience I would like to support the views put forward by Mr. Roaf (Jan. 14). I agree entirely that "as a medical ambassador only the best is good enough." It has to be remembered that many doctors in overseas territories have been trained in this country and know perfectly well who is who. To presume that the registrar is able to advise them on the organisation of their medical services is quite absurd. Consultants of recognised standing should be able to achieve much more in much shorter time, and a continual exchange of views with experienced specialists from this country would be of far greater value than long-term junior appointments. A scheme of short-term secondment of consultants is also likely, apart from the purely technical point of view, to create confidence and good will.

Harefield Hospital, Middlesex. E. NASSAU.

ARTIFICIAL HIBERNATION IN HEART-DISEASE

SIR,—In view of the discussions about the use of chlorpromazine that have appeared in your columns, we thought it might be of interest to report some effects of artificial hibernation in a new field. Our technique, applied in a considerable number of patients, has been essentially Laborit's method—i.e., vegetative inhibition by a mixture of chlorpromazine, promethazine, and pethidine in a ratio of 1 : 1 : 2, supplemented in case of need by hypothermia.

Two children with acute rheumatic pancarditis were desperately ill, and their cardiac function had not been improved by repeated digitalisation. Œdema had been uninfluenced by diuretics, and dyspnœa could not be relieved by any means. The question then arose whether their chances could be improved by artificial hibernation. One hour after treatment began, there was a dramatic improvement in their general state, and dyspnœa was entirely relieved. On lowering body-temperature to 31°C and 33°C respectively, the pulse-rate and respiration-rate fell to normal. Within the next twenty-four hours diuresis was so copious (6 and 8 litres respectively) that œdema practically disappeared. The lives of these children could not be prolonged for more than a few days. Nevertheless this experience suggests that even in the gravest forms of acute pancarditis artificial hibernation may enable sufficient time to be gained for the condition to be controlled by other means.

The diuretic action of hibernation was immédiately tested in a number of other patients. In two children with chronic rheumatic heart-disease, adequate diuresis could not be induced even by adult doses of mercurial diuretics and theophylline. Two doses of the "lytic cocktail" were given within half an hour, each of them containing 0·25 mg. of chlorpromazine per kg. body-weight; a mercurial diuretic was given at the same time. The resulting diuresis was about three times as great as any previously attained. Both in these and in similar patients there was a rapid decrease in the size of the liver and in the extent of œdema. In the same patients a similar diuretic effect was not elicited when, instead of the complete cocktail, one of its constituents was given with the diuretic.

1st Department of Paediatrics, Budapest University Medical School. J. SZUTRELY, P. V. VEGHELYI.

ALLERGY TO MALE SEX HORMONE

SIR,—I have observed a curious allergic phenomenon in a 51-year-old woman during treatment of breast-cancer metastases with male sex hormone.

The patient said that as a child she had had morbilli, scarlet fever, and diphtheria. Menstruation had started at the age of 12 years. At the age of 30 she had been operated on for ruptured ectopic pregnancy. The menopause began at 45; flushes had ceased. In November, 1954, a firm nodular tumour was detected in the upper lateral quadrant of the left breast. A radical mastectomy was performed, followed by X-ray treatment with 6000r. She gained 2 kg. in weight. In February, 1955, she felt tired, became dyspnœic, and had pain, associated with respiration, in the left side of the chest.

On admission the secondarily healed mastectomy scar, 10 cm. long, was surrounded by a sharply bordered area of pigmentation, measuring 4 × 12 cm. In the left chest were clinical and radiographic signs of pulmonary metastases and pleural exudate; and histological examination of the exudate revealed malignant cells. Blood-count: 3,600,000 red cells per c.mm.; hæmoglobin 72% (Sahli); white cells 9600 per c.mm. (differential count normal). Erythrocyte-sedimentation rate 90 mm. in 1st hour (Westergren). Urine: pus cells present.

Hormonal treatment was started on March 29 with daily injections of 50 mg. (2 ml.) 'Oreton' (testosterone propionate). Four days later the patient complained of itching of the scar. The pigmented area became reddish, swollen, and tender. Administration of 'Antistin' 0·1 g. (2 ml.) caused the itching to cease temporarily, but continuation of this treatment produced discoloration and renewed itching. A scratch test on the forearm revealed faint sensitivity to 0·1 ml. oreton and also (a few days later) to 0·1 ml. 'Androfort' (another testosterone propionate preparation). On the same day we injected 0·1 ml. androfort into the skin of the pigmented area near the scar; after three days an area of necrosis measuring 0·3 × 0·2 cm. developed. Control injections with sesame oil and saline solution gave no reaction at all. After four simultaneous injections of oreton and antistin, the urticarial reddening subsided and the injections of the hormone were resumed without further reactions. The patient went steadily downhill, and she left the hospital on June 13 in an extremely grave condition. She died a few days later at home. Permission for necropsy was not granted.

It seems indisputable that the reddening and itching of the X-ray-pigmented area was an urticaria-like allergic reaction, and this was proved by the immediate response to anti-histamine substance and the successful desensitisation. Obviously the patient developed hypersensitivity to male sex hormone, though she had never before been treated with this. The sensitivity was not to a particular preparation of the drug, because the scratch test was positive both to oreton and androfort.

The fact that intracutaneous injection of 0·1 ml. androfort produced an Arthus-like necrosis in the X-ray-pigmented area favours the assumption that local (sessile) antibodies were present.

How did this sensitivity develop? The short interval between the start of treatment with male hormone and the development of the urticarial reaction is against the possibility of sensitisation to the injected hormone. It is, however, well known [1] that physical factors, such as X rays, may cause concentration of the circulating antibodies in the corresponding part of the skin; and the antibodies thus become localised. There are several possible sources of these circulating antibodies: (1) the provoking antigens might be breakdown products of the endogenous androgens, this biochemical process having been influenced by the X rays in the highly vascular

1. Rajka, E. *J. Allergy*, 1942, **13**, 327.

area of the mamma; (2) the female sex hormones might take on local antigenic properties by passing through a similar denaturing process due to the radiation injury; or (3) in the mammary region, denatured cholesterol derivatives (the breakdown products of healing tissue cells, rich in cholesterol, and exposed to the heavy injury of irradiation with 6000r) might act as antigens and produce multivalent antibodies directed against a series of structurally related steroid hormones.

Whatever the explanation, it seems that the primarily fixed antibodies, or those becoming sessile under the influence of the X-irradiation, manifested themselves by a pronounced allergic reaction. Since general sensitivity to testosterone propionate (though in lesser degree) was demonstrated, and the Arthus-like local necrosis suggested either an immediate or a delayed hypersensitivity,[2] antigenicity of the endogenous steroid hormones seems the most probable explanation.

II Medical Clinic,
University of Budapest,
VIII Szentkirályi utca 46. L. MOSONYI.

OPPORTUNITIES IN AUSTRALIA

SIR,—I read with interest your correspondent's article last week. I had a practice for several years in a small country town, such as is mentioned by your correspondent. I should go further and say that to earn this figure of £A8000 per annum was exceptional and that £A5000, with one-third expenses, was much more general. I do agree that most Australians welcome English graduates. They also have a very high standard of all-round general practice, particularly surgery.

I should finally like to add that it is a well-worthwhile adventure for anyone without family restrictions and that, as stated, three years would see him well established.

Manchester. R. I. JOHNS.

INTERMITTENT CLAUDICATION AND SYMPATHECTOMY

SIR,—I have read with great interest the paper by Mr. Mavor (Oct. 15) in which he states that in the patients he has reviewed by questionnaire sympathectomy has had little or no alleviating effect on intermittent claudication due to atherosclerotic occlusion of large arteries. Although he has cited the observations of previous workers who have maintained that benefit has been obtained in half or more of the patients treated, he has not mentioned any results similar to his own. I should therefore like to draw attention to my own observations [3] which support Mr. Mavor as to the ineffectiveness of sympathectomy in claudication. It is of interest to consider the reasons for the differences between the reported observations.

1. There is the patient's tendency to try to please the surgeon. On looking over my records, I have observed that on the day when the surgeon noted that the patient was much better and could walk further, according to my notes his walking distance was unaltered. I am rather surprised that Mr. Mavor's results were not more "favourable" in view of his second question: "Can you now walk further without leg pain?" I tried to frame the question in a more neutral manner: "Is the distance you can walk since operation: more, the same, less?"

2. After operation the patient can often walk further because he walks more slowly. One patient was pleased because he could walk much further, but added: "But of course I do not walk as fast." When asked what would happen if he walked at the same pace, he replied: "Oh, then I could only walk the same distance as before, but I have now learned that it is better to walk slowly!"

3. As Mr. Mavor has indicated, the relief of other ischæmic features may be taken into account by the patient when assessing the effect on the claudication. In claudication, the muscle pain is often associated with paræsthesia of the foot also occurring with exercise. After sympathectomy, although the former symptom may be unaffected, the latter may be alleviated.

4. The symptom of claudication may be alleviated by a placebo effect, even when assessed by a semi-objective test such as noting the number of circuits a patient can walk at a standard rate over standard steps.[4]

These comments are not offered as criticism of Mr. Mavor's findings, which are entirely in line with my own, but merely to mention my supportive evidence and to put forward an explanation of the differences between the findings of Mr. Mavor and myself on the one hand and those of most previous observers on the other.

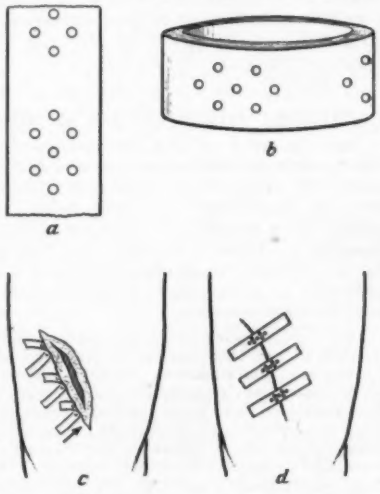
Baker Medical Research Institute,
Alfred Hospital,
Melbourne, Australia. A. J. BARNETT.

WOUND CLOSURE WITH PLASTIC TAPES

SIR,—For two years I have been investigating the closure of wounds with plastic tape. The kind I now use is much like the 'Cellophane' tape that can be bought at any stationers, but it is made of polyester plastic which stretches slightly in all directions and thus allows a little movement of the closed wound (figs. *a* and *b*).

The tape is coated on one side with a special adhesive which is non-toxic, and no skin reactions have been reported from its use in over 1000 cases. The adhesive is so compounded that it loosens on the sixth or seventh day after the tape is applied; but the period of adherence can be varied by changing the proportion of certain ingredients. The tape is perforated at regular intervals by a pattern of small holes allowing drainage of wound secretions.

To close a wound the edges are thoroughly dried and strips of tape are applied to the more mobile side of the wound (fig. *c*). The tape will not stick when placed lightly on the skin surface, and consequently it can be moved to exactly the right place before pressure is applied to make it firmly adherent. After the strips of tape have been attached to one side, they are used to pull the wound edges into exact apposition and then attached to the other side (fig. *d*). An ordinary gauze dressing is then applied and left undisturbed for six days. The tape will usually come away from the skin when the dressing is removed. Rarely, healing may be so slow that another application of plastic tape is needed.



One advantage of this method of wound closure is that it causes little pain, and it is therefore particularly useful in treating minor lacerations in children. But in treating such lacerations additional advantages were observed:

The average healing time was shortened by a day or more.
The scar was less noticeable.

2. Raffel, S. Immunity, Hypersensitivity, Serology. New York, 1953.
3. Barnett, A. J. *Aust. Ann. Med.* 1954, **3**, 295.
4. Newman, H. C., Barnett, A. J. *Ibid*, 1955, **4**, 195.

Closing the average laceration took less than half the time needed for suturing.

It was economical.

Pain caused by the removal of sutures was eliminated.

There were no suture scars.

Plastic tapes have been used to close about 100 major surgical wounds. There have been no reports of a failure to secure an average or better-than-average closure, and abdominal scarring is much less than when the skin is sutured.

In a few cases plastic tape has been used to hold skin-grafts in place. No assessment of its merits can be made until further work is done, but at present this method looks promising.

I will gladly send samples of the plastic tape, or further information about it, to any doctor willing to report critically upon his results.

8124, Princess Jeanne, N.E., Albuquerque, New Mexico. PAUL WILLIAMSON.

MODIFIED QUECKENSTEDT TEST

SIR,—Dr. Belton seems to be labouring under a misconception: the Valsalva manœuvre does not replace the orthodox Queckenstedt test. The former will show a significant rise of cerebrospinal fluid (C.S.F.) pressure below the level of the lesion in cases of complete spinal block, as the raised intrathoracic and intra-abdominal pressures are transmitted to the spinal subarachnoid space through the vertebral venous plexuses. Thus, if the Valsalva manœuvre is employed, the manometric diagnosis of partial or complete spinal block may be missed. Incidentally, the rise of C.S.F. pressure resulting from Queckenstedt's manœuvre occurs so quickly that it must, in part, be due to the sudden swelling of the intracranial veins, which displaces some C.S.F. into the slightly elastic spinal subarachnoid space.

Leicester Royal Infirmary. H. J. GOLDSMITH.

"MUNCHAUSEN'S SYNDROME"

SIR,—On reading Mr. Mawson's letter (Jan. 14) I recognised that the patient he described had been under my care in this hospital in November, 1955.

He was admitted via our casualty department on Nov. 23 on a stretcher, having been picked up in the city suffering from ataxia followed by a blackout. He gave a history of three mastoid operations and one for cerebral abscess within the past twenty-two months, the last operation having been performed about four months previously. He said that he was still "on parole" from a hospital in London. He stated that he was an ex-male-nurse and ship's radio officer, and he was in Dublin to visit his fiancée.

Besides some of the findings described by Mr. Mawson we found definite slight papilloedema of the right disc; the right visual field was constricted generally. Radiography showed almost complete loss of trabecular detail in the right mastoid region; a great deal of bone had been removed in each occipital region, and there were several trephine openings at a higher level; on each side opacities resembling Michel clips were present.

On the next day, his condition having improved and in view of suspected cerebral abscess possibly necessitating intracranial exploration, he was advised to return to London at once to the hospital where he had received his previous attention. In order to expedite his return, and as he had not got the full air fare, he was offered a sum of money. Of this he took only part, but three days later the hospital had an inquiry from a city mission where he had been seeking further assistance. This was the last we heard of him.

I write these few notes in the hope that they may help the next colleague under whose care this patient comes.

Adelaide Hospital, Dublin. R. S. W. BAKER.

SIR,—A seaman answering the description given by Mr. Mawson reeled into casualty the other day, now presenting a marked cerebellar gait.

His temperature of 101°F could not be shaken. He was therefore admitted for observation but refused lumbar puncture. Atkinson Morley Hospital had already heard of a man resembling this one, with multiple cranial scars on the right side and a right facial palsy; Princess Beatrice Hospital had dealt with him some time before. Following an abrupt but punctilious interview by a physician the following morning, he took his own discharge stating he was Plymouth bound.

Croydon General Hospital. F. M. MOORE.

SPORADIC CRETINISM WITH GOITRE

SIR,—I was most interested by the views expressed by Dr. McGirr and Dr. Hutchison in their letter of Jan. 14. It should however be pointed out that their statement "this [Stanbury et al.[1]] was the first time that the spontaneous occurrence of diiodotyrosine in the peripheral blood was conclusively proved" is not entirely correct. Benua and Dobyns [2] showed that small amounts of mono- and di-iodotyrosine are present in the blood of hyperthyroid and thyroid cancer patients after therapy doses of I^{131}. Monoiodotyrosine, but not diiodotyrosine, was excluded as a radiation artefact. Further, Benua and Dobyns [2] showed that neither of these compounds was produced from pure I^{131}-labelled thyroxine, during their chromatographic procedures.

National Institute for Medical Research, Mill Hill, London, N.W.7. ROSALIND PITT-RIVERS.

OLD FOLKS AT HOME

SIR,—Sir Selwyn Selwyn-Clarke's address, from which you published extracts on Jan. 14, suggests many ways in which old people can be assisted. But it would be a pity if any reader drew the conclusion that all is well in this field—which is by no means correct.

Although several ways and means of helping old people have been mentioned, it has not been made sufficiently clear that, good though these services are, they are not by any means to be found everywhere. Indeed some of the examples given are isolated instances of a voluntary body endeavouring to meet a local need after a careful study of the problem. It is a great pity that many of these services cannot be reproduced in more places, for I am convinced that the most important task of the voluntary bodies in this field at the present is the provision of properly integrated domiciliary services. It is no easy task; for in many instances patience, skill, and devotion are required to a degree not possessed by all. There are old people who are anti-social and "difficult" for whom often nothing is done until some near-tragedy occurs. True the health visitors and the district nurses do wonderful work, but in many places their time is so taken up with family work that they cannot attend to old people as they would wish, and there is, perhaps, less attention given to prevention than to cure. I refer here not necessarily to medical treatment but to the support which can be given to old people, by a trained social worker, when they are beginning to deteriorate. Too often nothing is done until the failing has gone too far to allow the old person to remain in a place where there is not constant supervision and this leads to an increasing demand for beds on the welfare and hospital services.

There are a number of other points on which I should like to comment; but there is one particular sentence which cannot fail to be noticed by general practitioners, social workers, and others. "But when the nature of the illness or social conditions necessitate hospital care . . . the patient *will* (my italics) be removed, with his consent, to a hospital." How easy it sounds!

National Corporation for the Care of Old People, Nuffield Lodge, Regent's Park, London, N.W.1. M. R. F. SIMSON Secretary.

1. Stanbury, J. B., Kassenaar, A. A. H., Meijer, J. W. A., Terpstra, J. *J. clin. Endocrin.* 1955, **15**, 1216.
2. Benua, R. S., Dobyns, B. M. *Ibid*, p. 118.

CHILDREN IN HOSPITAL

SIR,—I very much enjoyed the stimulating paper by Professor Illingworth and Dr. Holt (Dec. 17). I would say, however, that this matter of children in hospital has been over-dramatised.

In my experience—and this must be surely universal too—it is the *only* child, especially of elderly parents, or the *youngest* child of a large family, especially if spread out chronologically, that is *most* likely to become fretful. (It was an only child that was portrayed in *A Two-year-old Goes to Hospital*—a film that in my view has exerted an influence disproportionate to its real value, dealing as it does with only one case.) In such circumstances it is the mother or both parents who fret more than the child, and who, becoming over-anxious, transmit anxiety to their offspring.

Compared with other features of many children's lives—such as being left with neighbours while the mother goes to work, the distractions of television and films, and lax discipline at home and (through no fault of the teacher) at school—a stay in hospital is likely to do little harm to a child's mental health. There is a tendency for certain parents to fob off their own shortcomings on to those of us (doctors and nurses) who work in hospital under increasingly difficult conditions.

I entirely agree that every parent has a right to see his child when ill in hospital, and daily visiting is the rule here. But we should see that the right is not abused, and that a sense of proportion is preserved.

Ilford Isolation Hospital. I. M. LIBRACH.

TUBERCULOSIS STATISTICS

SIR,—At the end of each year both the Ministry of Health and the Middlesex County Council ask every chest clinic to state the number of patients removed from the tuberculosis register during the past year, because of death. I find that this figure is then widely quoted as the tuberculosis-mortality rate. This is, of course, most misleading and fallacious as an appreciable proportion of the patients have died from some intercurrent disease while having treatable or treated tuberculosis.

In my area, which serves a population of about 150,000 people, the number removed from the register because of death in 1954 was 22; 14 succumbed to the disease itself, but 8 died from a separate condition. For 1955 the figure is 22; 15 died from pulmonary tuberculosis and 1 died from tuberculous enteritis, but in 6 the death was not related to the tuberculosis. This means that in these two years about a third of the deaths were not attributable to tuberculosis. This is an appreciable proportion, and is likely to get larger in future years, so the annual number removed from the register because of death will become an increasingly worthless figure.

We are also told that the notification-rate is not falling, and that its constant high level is a reflection on the methods used to eradicate this disease. This is, to my mind, illogical reasoning and quite unjustified.

In the past only a small proportion of the total number of infected patients in the community were found, and these were for the most part young adults with well-established disease accompanied by obvious symptoms. Today, I believe, because we have extended our search we find most of the infected patients in an area at any given time, and the cases discovered now include many people over the age of 60, and a number of young people with minimal symptomless, but active, disease. The fact that tuberculosis is becoming effectively controlled is best demonstrated by the rapidly falling percentage of children and young adults who have a positive tuberculin skin test.[1]

For the time being, therefore, I am glad that the notification-rate remains high, as it means that our case-finding methods are effective; and if it is even higher next year it will be a matter for congratulation, because as the number of cases gets less, so the finding of them will be all the more difficult.

I would, therefore, suggest that the battle against tuberculosis is being won more rapidly and efficiently than certain official statistics would lead us to believe.

Ashford Hospital, Middlesex. P. E. BALDRY.

PERSONALITY CHANGES AFTER FRONTAL LEUCOTOMY

SIR,—Because of the repercussions from discussion of my book [1] in various places, including the lay press, and as more will have seen these than will have seen the book, colleagues have suggested that I comment on the main issue.

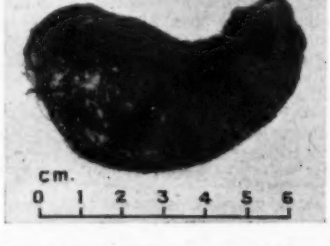
The book does not say that leucotomy is, universally, a bad operation; because it does not deal with this aspect. It describes changes in the personality after severance of the frontal lobe by the standard operation; it describes not only the nature but also the extent of these changes. Usually they are overshadowed in clinical practice by the modifications (if we may talk of them separately) in the various symptoms for which the operation is performed.

Therapeutic procedures—e.g., laparotomies—sometimes produce æsthetically undesirable results. The consequence is accepted on pragmatic grounds. So, after major leucotomy operations, there can be socially significant changes which are undesirable. Because of this, modified operations are in use. I support the view that, as with other treatments in psychiatry, until we have something better they have to be, if appropriately employed, part of our available therapy.

Oxford. P. MACDONALD TOW.

TRICHOBEZOAR

SIR,—May I once again draw attention to this very interesting condition? When you published my account [2] of a case in which the hair-ball had entered the small bowel of a child and caused obstruction, I thought that this was probably one of the first of its kind to be reported in Britain. In 1928, however, Mr. C. Noon, of Norwich, had recorded [3] a case, in a woman aged 30, of intestinal obstruction due to four separate hair-balls. I have very recently removed a hair-ball from the small bowel of another child.



The patient, a girl, aged 7, had several times been in hospital under the care of Mr. J. S. Ramage with developmental anomalies of the renal tract, which included a supernumary kidney and a double urethra. She had had many attacks of ascending urinary infection, and was admitted again on Dec. 29 last with abdominal pain and vomiting. This attack, however, was rather different, and she appeared to have a small-bowel obstruction with a palpable mass in

1. Grenville-Mathers, R. *Lancet*, 1955, ii, 1341.

1. Personality Changes following Frontal Leucotomy. London, 1955.
2. *Lancet*, 1954, i, 761.
3. *Brit. med. J.* 1928, i, 342.

the right iliac fossa. At laparotomy a hair-ball was removed from the lower jejunum, where it was impacted and was already beginning to ulcerate through the gut wall.

The hair-ball (see figure) was about 7 cm. long and 5 cm. wide at one end. The child had been noticed chewing her hair while in hospital, and her parents stated that she had always done so from early childhood.

Trichobezoar has rarely been reported in man, particularly as a cause of intestinal obstruction. My two cases in six years suggest that the condition is commoner than we believe.

North Staffordshire Royal Infirmary, Stoke-on-Trent. H. S. TRAFFORD.

CERVICAL VERTIGO

SIR,—It is most interesting to see the different opinions on the ætiology of paroxysmal vertigo, the latest contribution to which is made by Dr. Ryan and Dr. Cope (Dec. 31) under the above heading.

I myself made a small effort to solve this problem.[1] I have also observed that pain stimuli in the head and neck, for example, may elicit attacks of vertigo by bending the neck, but not pain alone except in patients with migraine. In these particular cases of vertigo I have always found an imbalance of the masticatory apparatus, of which the muscles and joints and also the trigeminal nerve are involved, owing to a faulty bite. The vertigo would be a reaction of the ear to a physical irritant, and I suggested [1] that the paroxysm is caused by myoclonus of the middle-ear muscles.

In addition to the instability of the sensory organ in the semicircular canals in these cases, there is also an affection of the cochlea. This may be fluctuating or permanent, subjective and/or objective, and perceptible by audiometric examination. The lesion does not seem to be cervical.

Bergen kommune sykehus, Bergen, Norway. H. MYRHAUG.

SIR,—In reply to Mr. Wilmot's comments (Jan. 7) on our article (Dec. 31): by aural investigation we meant that audiometry and caloric testing were carried out in addition to clinical examination. The question of cervical sympathetic involvement in the quoted cases was discussed in the paper, and though we considered it a possible mechanism our reasons for favouring the alternative explanation were given. The presence of cervical disease and vertigo does not of itself signify that the two are related. What we wished to show was that there is a characteristic clinical picture by which cervical vertigo can be diagnosed.

Royal Southern Hospital, Liverpool. S. COPE
G. M. S. RYAN.

ANÆSTHESIA FOR CÆSAREAN SECTION

SIR,—In an earlier letter [2] I referred briefly to anæsthesia by hexobarbitone, suxamethonium bromide, and nitrous oxide for cæsarean section. I have received many inquiries about the technique.

Patients come to the theatre with a Ryle's tube in situ, premedicated with gr. $^1/_{100}$ atropine sulphate. The stomach is aspirated immediately before induction.

When the patient has been towelled 0·5 g. hexobarbitone is given intravenously, followed immediately by 60 mg. suxamethonium bromide ('Brevidil M') through the same needle, and the surgeon makes his incision.

While the incision is being made the patient's lungs are gently inflated with a mixture of nitrous oxide (75%) and oxygen (25%) until the relaxant has taken effect. Then the patient is intubated and the nitrous-oxide/oxygen mixture is continued; a Gordh needle is put into a vein on the back of one hand, and the forearm flexed to bring the needle within easy reach of the anæsthetist.

Once the delivery has started the nitrous oxide is cut off and the patient's lungs are flushed with pure oxygen until the cord is cut: when the cord is separated the patient is put back on the former nitrous-oxide/oxygen mixture, and a further 0·5 g. hexobarbitone is given through the Gordh needle—by means of which ergometrine has already been given at the time of delivery.

Usually the effect of the suxamethonium bromide has worn off by the time delivery takes place, but sometimes either the surgeon is quicker than usual or the action of the relaxant persists unusually long, and the mother is apnœic when the child is born; but on no occasion has the child's respiration been depressed, and it would appear that the suxamethonium bromide is "lost" in the placenta.

I have never seen maternal or fœtal respiration depressed by hexobarbitone, and I prefer this technique to any other, including spinal anæsthesia.

Gloucester Royal Infirmary. J. SHEGOG RUDDELL.

UTERINE DYSFUNCTION DURING LABOUR

SIR,—I have suggested [1] that uterine dysfunction may be related to the patient's personality, and have described a "dysfunction temperament" characterised by suppression or repression of feelings of tension, so that little or no overt anxiety is shown. Women with this temperament are reserved and difficult to know; they have a slight tendency to develop peptic-ulcer symptoms; and they have a bias towards rigid and conventional forms of behaviour.

This bias was deduced from the results of the Minnesota Multiphasic Personality Inventory,[2] which was completed by most of the patients I investigated. It was discovered that 45% of the dysfunction group had high "lie" scores compared with 20% of the control group, the difference being significant at the 2% level.

The "lie" score is based on the answers ("true" or "false") to the following 15 questions which are so devised that, if answered honestly, they place the patient in a socially unacceptable light.

1. Sometimes, when I am not feeling well, I am cross.
2. I would rather win than lose in a game.
3. I get angry sometimes.
4. I do not like everyone I know.
5. Once in a while I think of things too bad to talk about.
6. Once in a while I put off until tomorrow what I ought do today.
7. I gossip a little at times.
8. I sometimes laugh at vulgar stories.
9. My table manners are not quite as good at home as when am in company.
10. I do not always tell the truth.
11. I do not read every editorial in the newspaper every day.
12. If I could get into the cinema without paying and be sure I was not seen, I would probably do it.
13. At times I feel like swearing.
14. Sometimes at elections I vote for a man about whom I know very little.
15. I like to know some important people because it makes me feel important.

If a patient answered "false" to 7 or more of the 15 questions, her "lie" score was regarded as significantly high; that is to say, she tended to deny in herself venial faults which we all possess, but which we dislike to admit to other people lest we fall in their estimation.

In a subsequent investigation the 15 items of the "lie" scale were incorporated in an inventory with 65 other items dealing with pregnancy and with anxiety-producing situations, and the inventories were given to 900 consecutive primigravidæ who attended the Aberdeen Antenatal Clinic during the latter part of 1954 and the first half of 1955.

The test was administered by the health visitor in charge of the clinic and the completed inventories were sent to me

1. *Nord. Med.* 1953, **50**, 1107.
2. *Lancet*, 1955, ii, 1138.

1. Cramond, W. A. *Lancet*, 1954, ii, 1241.
2. Hathaway, S. R., McKinley, J. C. The Minnesota Multiphasic Personality Inventory. New York, 1940.

for scoring. When the women had been delivered in Aberdeen Maternity Hospital, their labour was classified by one of the senior obstetrical staff using Stewart and Bernard's classification.[3] At no time did the obstetrician or myself discuss the inventory scores or the labour classification. As about 90% of all Aberdeen primigravidæ pass through the Antenatal Clinic and are delivered in hospital, any selective factor likely to cause misinterpretation of the results is virtually excluded.

50 patients were excluded from the analysis, mainly because of "spoiled" replies or because (in 11 cases) they were delivered elsewhere. Of the 850 women who completed the inventory, 259 (30%) had significantly high "lie" scores, and this agrees with the proportion (32%) in my previous investigation. The distribution of major uterine dysfunction between the two groups was as follows:

—	High "lie" score (259)	Low "lie" score (591)	Total (850)
No. with major degrees of uterine dysfunction	7 (2·7%)	5 (0·8%)	12 (1·4%)

It will be seen that in labour 1 in 37 patients in the group with high "lie" scores had a major degree of uterine dysfunction, compared with only 1 in 116 patients with low scores.

These results support the hypothesis of a "dysfunction temperament," but further research is indicated.

I again thank Prof. D. Baird and Prof. W. M. Millar for their valuable help. I am also grateful to Mr. W. Z. Billiewicz, of the Social Medicine Research Unit of the Midwifery Department, Aberdeen, for his statistical evaluation of the results. I wish to thank the staffs of the Aberdeen Antenatal Clinic and the records department of the Maternity Hospital for applying the test.

Woodilee Mental Hospital, Lenzie, Glasgow. WILLIAM A. CRAMOND Physician Superintendent.

EFFECT OF COLCHICUM EXTRACT IN CHRONIC MYELOGENOUS LEUKÆMIA

SIR,—In the following case of chronic myelogenous leukæmia administration of a colchicum extract containing demecolcin caused a prompt and sharp fall in the white blood-cell count and an unusual increase in the blood-urea level.

A 21-year-old woman was admitted to hospital on Sept. 29, 1955, with chronic myelogenous leukæmia. On examination there was enlargement of the liver and spleen (28 cm. beyond the costal margin). Blood examination revealed Hb 6·4 g. per 100 ml., red cells 2,260,000 per c.mm., hæmatocrit 20%, and white cells 362,000 per c.mm.

RESPONSE TO THERAPY WITH A COLCHICUM EXTRACT

Date	Days of therapy	White blood-cells (per c.mm.)	Blood uric acid (mg. per 100 ml.)	Spleen enlt (cm.)	Other manifestations
Sept. 29	..	362,000	..	28	..
Oct. 5	1	..	..	..	..
.. 7	3	297,000	..	..	..
.. 10	6	..	..	..	Diarrhœa
.. 11	Stopped	86,000	..	22	..
.. 12	..	..	..	..	Rash
.. 13	..	..	5·1	..	..
.. 14	..	12,400	..	..	Necrosis of lt tonsil
.. 18	..	..	5·7	..	..
.. 19	..	..	..	19·5	..

On Oct. 5 treatment with a colchicum extract (containing demecolcin, a new alkaloid isolated by Sántavý and Reichstein [4] from *Colchicum autumnale*) 5 mg. daily was started, and this was continued for six days (total dose 30 mg.). The findings are summarised in the accompanying table.

Such a rapid leucolysis with a consequent increase in the blood-uric-acid level to 51 mg. per 100 ml. does not seem to have been reported previously.

1st Medical Clinic, Charles University, Prague II/499, Czechoslovakia. MILOŠ NETOUŠEK Director.

PLAGIARISM?

SIR,—James Parkinson in his original essay on the Shaking Palsy, written in 1817, describes the onset of the illness as follows:

"So slight and nearly imperceptible are the first inroads of this malady, and so extremely slow is its progress, that it rarely happens, that the patient can form any recollection of the precise period of its commencement."

Over thirty years later Thomas Addison describes the beginning of the illness now known as pernicious anæmia:

"It makes its approach in so slow and insidious a manner that the patient can hardly fix a date to his earliest feeling of that languor which is shortly to become so extreme."

The similarity is striking. Can any of your readers confirm or refute that Addison was guilty of plagiarism?

Aylesbury, Bucks. V. E. LLOYD HART.

HYPEREMESIS GRAVIDARUM

SIR,—The value of direct hypnotic suggestion in hyperemesis gravidarum is recognised.[1–4] Little, however, has been said of the psychological mechanisms at fault. The psycho-analytic viewpoint stresses the symbolic ejection of the unwanted fœtus. The following case illustrates a modern hazard in the formation of the symptom-complex.

A multipara, aged 30, was seen in a distressed and dehydrated state. She was eight weeks pregnant. She said that "a horrible feeling of sickness goes on all the time. I cannot keep anything down." During her first pregnancy she had slight vomiting and nausea, which disappeared spontaneously at the thirteenth week. Her childhood had been insecure. Her father abandoned the family when she was three years old. She was the youngest child and was always "spoilt."

She had been an inpatient in hospital for three weeks without improving. In view of the gross dehydration and rapid loss of weight, hypnosis was immediately induced and direct suggestions were given to combat the sickness. Two days later she reported that the sickness was less and that she had begun to eat a little for the first time in six weeks.

No attempt at analysis was made except to say, at the second interview, that these cases represented a desire of the mother to get rid of the fœtus through fear, guilt, or other anxiety. The patient denied that this was so in her case. She was eating well by the fourth interview, but excessive salivation, both diurnal and nocturnal, proved troublesome. At the fifth and last interview she explained that she had been frightened at the first pregnancy by learning that she was rhesus-negative. She was hypnotised and told that she would have no further fear and the salivation would stop. On waking the patient said: "I have had a sudden thought. I was told that if I was rhesus-negative I would be all right for the first baby but the second one might be deformed or born dead." This was the crux of the situation. She was re-hypnotised and told that she would have no further worry about the pregnancy.

3. Stewart, D. B., Bernard, R. M. *J. Obstet. Gynæc., Brit. Emp.* 1954, **61**, 318.
4. *Helv. med. acta*, 1950, **33**, 1606.

1. DeLee, J. B. Principles and Practice of Obstetrics. Philadelphia, 1913.
2. Kroger, W. S. Hypnosis in Modern Medicine. Springfield, Ill., 1953.
3. Kroger, W. S., DeLee, S. T. *Amer. J. Obstet. Gynec.* 1946, **51**, 544.
4. Paikin, M. I. *Zbl. Psychother.* 1931, **4**, 273.

After abolition of the vomiting, by direct suggestion, the patient's excessive salivation apparently symbolised the still-present need to rid herself of the fœtus. Later reports stated that she was well.

"There are many things, the knowledge of which is of little or no profit to the soul." [5]

London, W.1. GORDON AMBROSE.

POLIOMYELITIS VACCINE

SIR,—Extensive use of this vaccine in this country is now proposed. It may seem a presumption to raise any question when it has apparently such eminent sponsorship; but, as one of the persons who will be concerned with the actual administration of this vaccine, I cannot help feeling some uneasiness. It appears that the degree of protection given is not certain and also its duration. We are assured that the vaccine is fully safe; but one cannot but recall that poliomyelitis vaccines in the United States last year had disastrous consequences.

When this vaccine comes into use it will mean that three materials are being used in this country whose efficacy is uncertain and whose safety is open to doubt.

The first is B.C.G., which is being used on an ever-increasing scale although there is as yet no proof that it is of any value, while there is actual certainty that in a proportion of cases it produces damage of greater or less amount.

The second is whooping-cough vaccine, also being used on a large scale although we have not yet been given any statistics to show its value—if any. One had understood that a factual report on whooping-cough vaccine was to be published, but so far all that seems to be available are statements as to "clinical impressions." Many of us are not particularly interested in clinical impressions: we require figures.

Now this poliomyelitis vaccine is to be brought into general use without, to my mind, satisfactory evidence of its efficacy and safety.

Although poliomyelitis rightly causes great concern, both because in a small proportion of cases its consequences are disastrous and because it is a disease for which we have no specific treatment, nevertheless a sense of proportion is called for. Even in the worst years we have yet experienced, although the number of cases of poliomyelitis infection has amounted to several thousands, they represent a minute proportion of the population at risk, and the number of cases in which death or paralysis has occurred has been small in proportion to the population. Is it proper to administer a vaccine of doubtful potentialities to the child population at large to meet so small a risk? I agree that the individual parent, faced with the death of a child from poliomyelitis or with a paralysed child, will rightly regard this as a very great tragedy; but I do question whether the facts justify us, as yet, in undertaking a mass vaccination campaign. In saying this I would like to make it clear that I am by no means an anti-vaccinationist. I am an enthusiastic supporter of immunisation against diphtheria. Here the position is rather different, since we are dealing with the use of a chemical substance and not with an organism living or dead. I am also a firm believer in the value of anti-smallpox vaccination and yellow-fever inoculation. But I do think it is not unreasonable to suggest that poliomyelitis vaccines are as yet only in the experimental stage, and I do question whether we have any right to carry out a large-scale experiment which may have serious consequences. I would certainly hesitate myself, in the present state of knowledge, to give myself or my children this vaccine. I think that similar doubts may well be felt by quite a proportion of medical practitioners, and I therefore raise this matter to see if we may have some indication in your columns as to the extent of the doubts felt about this and also whether any convincing evidence can be brought forward to settle these doubts.

All this, I should make it quite clear, is a purely personal expression of opinion.

Accrington, Lancs. R. C. WEBSTER.

5. Thomas à Kempis. De Imitatione Christi. Chapter 2.

Obituary

WILSON HAROLD HEY

M.B. Manc., F.R.C.S.

Mr. Wilson Hey, consulting surgeon to the Manchester Royal Infirmary, died on Jan. 15 at the age of 73. He was a general surgeon with a strong bias towards urology and he will be remembered particularly for his work on prostatic carcinoma and for the method of prostatectomy that he devised.

He was born in Colne, which lies in the heart of Lancashire, and he early showed the determination and stubborness said to be characteristic of the palatinate. He entered Manchester University with a leaving scholarship from Burnley Grammar School, and he proved himself an outstanding student with an original mind. His retentive memory and capacity for work served him well, and he won many prizes, medals, and scholarships. After graduating M.B. in 1905 he held house-appointments at the Manchester Royal Infirmary, later becoming resident surgical officer and surgical tutor. He was awarded the Tom Jones Research scholarship in surgery and in 1908 he took the F.R.C.S. Shortly before the outbreak of war in 1914 he was appointed to the honorary staff of the Royal Infirmary; but almost at once he left Manchester to serve as a surgical specialist with the rank of major in the R.A.M.C. For his services to French soldiers he was appointed a chevalier of the Legion of Honour.

Schmidt, Manchester

On his return to Manchester after the war Wilson Hey's surgical technique and his energy soon gained him a large practice. In 1919 he was appointed to the staff of the Christie Hospital and he was one of the first surgeons to use radium. He also joined the staff of the Ancoats Hospital, and the Manchester Children's Hospital. He was lecturer in clinical surgery at the university: he was an interesting and stimulating teacher and students flocked to his outpatient department, for he knew how to pinpoint a principle with an unbelievable but also unforgettable anecdote.

Despite his large private practice and his hospital and teaching duties, his original turn of mind and energy obliged him to make time for research. Urological surgery had long been his chief interest; and he showed that, in his hands at least, the emergency removal of the prostate gland was a safe proceeding. His "aseptic" operation was a transvesical prostatectomy (preceded by twelve hours' chemotherapy) in which the trigone was excised and the bladder afterwards closed. He was insistent that "technique and route are merely the handmaidens of asepsis in any operation," and he urged that a catheter should never be used before prostatectomy. Latterly, he was also investigating the use of hormones in breast and prostatic cancer and shortly before his death he was putting the finishing touches to his record of his results in cancer of the breast for the last thirty years. An old patient had left him a large sum of money to establish a hormone research department at the Christie Hospital and he was preparing the plans for this project.

His energy spilled outside his work, and in 1950 he was able to preside over the new Manchester Medical Society, which, largely through his efforts, had grown out of the amalgamation of five local medical societies.

His leonine physical appearance did not belie his strength. As a student he had been a useful rugby forward, and as he grew older he became an intrepid mountaineer. He was a past member of the Council of the Alpine Club and a past president of the Rucksack Club. He was a moving spirit in the Mountain Rescue Committee and in 1939 he became chairman. Believing that trained rescue parties should be allowed in an emergency to use small amounts of morphine, he drew public attention to this by inviting the Home Office to take legal action against him for supplying morphine for this purpose. In court he pleaded guilty and was fined £5. Soon afterwards the Home Office agreed to this extension of the use of morphine.

W. R. D. writes:

"Quite early it became clear that Wilson Hey was an unusual type and would probably go far. This prophecy was fulfilled in his later life. His enthusiasm for any work he undertook was impressive. He had an unusual quality of brain which almost verged on genius: he was certainly original and he never hesitated to express his views in face of the strongest opposition. He was not an easy man to know. Underneath his suave and charming manner lay a deep understanding of the human element and a great kindliness. He would fight to the last ditch for any cause which he decided was right, as was shown in his fight for the supply of morphia to the Mountain Rescue Club. He had been ailing for a considerable time, but his work so obsessed him that he refused all advice to retire. His name will ring down the corridors of the Royal Infirmary and Christie Hospital for many years to come. In the last half century Manchester has produced a number of outstanding surgeons, and amongst them the name of Wilson Harold Hey ranks very high."

Mr. Hey leaves his widow, Dr. Elsie Hey, with two sons and two daughters, one of whom is a doctor.

ARTHUR FELIX

D.Sc. Vienna, hon. D.Sc. Belf., F.R.S.

Dr. Felix, whose death on Jan. 14 we announced last week, was pre-eminent in his own field of bacteriology. For nearly 40 of his 68 years he had been an international figure.

Born in Poland, he completed his studies in Vienna, and during the 1914–18 war he was employed as a bacteriologist in the Austrian army. Working for part of the time in field laboratories, often under adverse conditions, he gained much experience of exanthematic typhus, and in conjunction with Weil he isolated the non-motile variant of proteus that reacted specifically with the sera of typhus patients (the Weil-Felix reaction). It was also with Weil that he observed the O and H types of salmonella colonies corresponding to the flagellated and non-flagellated state of the bacteria: from this they worked out the two bacterial antigens, the heat-stable O (somatic), and the heat-labile H (flagellar). After the war they collaborated in Prague, and Felix always held Weil in grateful recollection.

In 1921 he went to Palestine in accordance with his Zionist principles. He remained there, as bacteriologist to the Hadassah Medical Organisation, until 1927, when he came to England and entered the Lister Institute. There, happy in his friendship with Ledingham and in the congenial atmosphere he found, he settled down to one of his most profitable periods. At first, with Dr. Muriel Robertson, he demonstrated H and O forms of the anaerobes *Clostridium tetani* and *Cl. septicum*, and from the O antigen of the latter they produced an antibacterial serum, devoid of antitoxic content, which was of theoretical interest, though it had no practical application to the treatment of gas-gangrene. His most important work at the Lister Institute, however, was his concentrated investigation of the salmonellas and the discovery of the Vi antigen in the typhoid organism, and it was the characteristics and behaviour of salmonellas that continued to engross him after he joined the Emergency Public Health Laboratory Service in 1939 and became director of the Central Enteric Reference Laboratory and Bureau at Colindale when it was established just ten years ago.

Looking back over his career one is struck by the ordered progression of his studies. His research outlook was essentially practical, and his activities, applied to the control of infection, seemed to follow a definite plan. He began by investigating the nature of the organisms responsible, and establishing exact methods of diagnosis; then he passed to prophylaxis, and finally to the development of biological tools for exact epidemiological inquiries.

The Weil-Felix reaction was useful and important; but his contributions to fundamental bacteriology arose out of the very accurate investigations of the proteus X organisms and the non-motile variants, and led to the demonstration of the double antigen complex—somatic and flagellar—in motile bacteria. More than ten years previously Smith and Reagh had observed that normal hog-cholera bacilli agglutinated differently from non-motile variants, but the significance of the observation had not been fully appreciated. In rediscovering the phenomenon Weil and Felix investigated it very thoroughly and showed that the large-flaking agglutination of motile organisms was associated solely with the flagella and that the fine granular agglutination seen with the proteus OX was seen only in non-motile organisms.

The extension of the proteus studies to the typhoid-paratyphoid organisms was the next step, and on the greater part of this Felix worked alone. His later observations on the O-inagglutinability of living cultures of some strains of typhoid led to the discovery of the third type of antigen (Vi); and then his endeavour to prepare an improved typhoid vaccine, with the new antigen unimpaired, resulted in the alcohol-killed alcohol-preserved T.A.B. vaccine.

The persistence of Vi-antibody in a significantly high proportion of typhoid carriers further extended his epidemiological interest, and with the publication of Craigie and Yen's work on the Vi-bacteriophage types of the typhoid bacillus he was quick to seize the opportunity of using this discovery and developing it further for the fine classification of known typhoid carriers and as an epidemiological tool.

As a scientific worker, his strongest characteristic was his capacity for studying a problem with persistent attention, and on one occasion he described himself as an instrument tuned to a single note. But he never lost interest in any subject he had touched, and to the very end he had as great an interest in the Weil-Felix reaction as in the determination of phage-type in an outbreak of paratyphoid fever.

H. J B. writes

"Felix's work was characterised throughout by the simplicity and clarity of the design of his experiments. He always used simple equipment and he relied on accurate observation, exact technique in performance, and the inclusion of all possible controls in every test. His laboratory records were models of perfection, nearly all in his own neat handwriting on foolscap sheets, carefully filed and stored over the years. He had complete confidence in the correctness of his observations and the reliability of his experiments and their records. This made him a fearless adversary in any controversy on matters concerning his own work, and if the necessity arose he never hesitated, in this connection, to speak forcefully on what was in his mind.

"He did not profess to teach, but he was an excellent instructor whether in person or by his written word. My first experience of this came many years before I met him. Just after the first world war, when I was working in Constantinople, many cases of typhus fever were being received from the Crimean area, and I found the precise and detailed instructions for the maintenance of the proteus OX strains and the performance of the Weil-Felix reaction that originated from him of the greatest help. The importance of using only the non-motile variant of the proteus X strains for the

preparation of the antigen was not generally understood, and the wide use of the Dreyer technique designed for H agglutination influenced many workers to allow their culture of proteus OX to revert to the OH form and thus to lose specificity. By slavishly following Felix's instructions I was saved from this error. Later I came to know him personally, we corresponded much when I was overseas, and there were continual reminders of the clarity of what he wrote. He took infinite pains to express himself clearly in correct English.

"Felix travelled widely and enjoyed travel. He knew eminent bacteriologists in most countries, and he liked to visit them in their laboratories. Because of this he was a mine of information about most of the personalities in the bacteriological world. A hard master, he demanded much of his assistants; but he himself was a slave to his own work. He believed in the importance of his own department, but he also understood the need for a sense of proportion in a large institute. He was not given to great social activities, but he was a thoughtful and generous host, and a loyal and powerful friend, capable of great charm and kindness; and he had a gentleness that sometimes surprised those who did not know him well."

Dr. Felix stayed at Colindale as director of the Central Enteric Reference Laboratory until his retirement under the age-limit in April, 1954. Still fully active, and working under a special grant for two years, he was given accommodation at the Lister Institute to complete unfinished work. There he continued at full tempo until the very end.

ARCHIBALD FRANCIS WRIGHT

M.C., M.B. Edin.

Dr. A. F. Wright, pathologist to the Coventry and Warwickshire Hospital from 1924 until his retirement in 1951, has died at the age of 72.

He was born at Southport and educated at Monmouth Grammar School, Edinburgh Academy, and the University of Edinburgh, where he qualified in 1906. In the same year he was appointed to the staff of the Monmouth Hospital. In 1910 he became bacteriologist and consultant clinician for venereal diseases to the Staffordshire County Council. During the 1914–18 war he served with the R.A.M.C. as bacteriologist. He was mentioned in despatches and awarded the Military Cross. In 1920 he visited the West Indies as a member of the Medical Commission to Combat Venereal Diseases.

After his demobilisation he decided to specialise in clinical pathology, and he served as pathologist, always with a strong clinical bias, on the staffs of hospitals in the West Midlands, finally coming to rest in Leamington as pathologist, first to the Warneford Hospital, and in 1924 to the Coventry and Warwickshire Hospital. He was a far-sighted and competent organiser, and it was thanks to him that between the wars the authorities of the Coventry and Warwickshire Hospital and the Coventry Borough Council were persuaded to set up a joint laboratory service, with a laboratory within the hospital. Such an arrangement is now commonplace, but at that time such close coöperation between a voluntary hospital and a municipal health authority was unusual. The joint laboratory service proved of the greatest benefit both to the hospital and to the health service of the borough. In 1938 he started a blood-transfusion service based on the laboratory, and at the outbreak of the late war it had already enrolled over 10,000 donors. He was a founder member of the Association of Clinical Pathologists, and he served on the advisory committee in pathology of the Birmingham Regional Hospital Board from its inception until his retirement.

S. C. D., to whom we are indebted for some of this information, adds:

From the beginning of his medical career Dr. Wright was imbued with a sense of the importance of the laboratory in clinical medicine, at that time practically unrecognised in British medical practice. It may truly be said that he introduced clinical pathology into the West Midlands. For some time before and since his retirement, his health was not good, and latterly few of his colleagues had seen much of him. It is a sign of their affectionate regard that to them he was always "Pop." With his passing, a figure that had become and will remain traditional has disappeared.

CARL EISINGER

M.D. Vienna, L.R.C.P.E.

Mr. Eisinger, ear, nose, and throat surgeon to the West Middlesex Hospital, Isleworth, died in London on Jan. 14. He was born in Vienna in 1895, and he qualified there in 1920. He worked first at the Institute of Embryology, where he became lecturer under Prof. H. Fischel, and published papers on the artificially induced division of unfertilised ova in mammals, and the extirpation of the inner ear in amphibia. He later turned to ear, nose, and throat work and was elected to the staff of the Vienna university hospital under the late Prof. H. von Neumann. He was appointed Dozent in 1934. Four years later, when Austria was taken over by the Nazis, he was forced to leave Vienna.

When he arrived in England he expected to go to the United States, where he had been offered a post at St. Louis, but when he was appointed postgraduate lecturer at the Metropolitan Ear, Nose, and Throat Hospital, he decided to remain in this country. In 1940 he took the Scottish conjoint qualification. Later he was appointed to the staffs of the Metropolitan Ear, Nose and Throat Hospital and the West Middlesex Hospital. During the late war he was honorary lecturer at St. George's Hospital Medical School.

After the war Eisinger was twice approached on behalf of the University of Vienna, with a view to his taking up the chair in otorhinolaryngology there, but he preferred to stay in the country of his adoption.

R. S. G. writes:

"I had the good fortune to meet Carl Eisinger over twenty-five years ago in Vienna when he was senior assistant in Neumann's department, where he taught many hundreds of postgraduates from all parts of the world. In 1938 he came to this country and was welcomed by a large number of otologists who had attended Neumann's clinic, and was induced to stay in this country. He was a man of culture, who lived for his profession and love of people; and, with a wide knowledge of his specialty, which he practised with courtesy and dignity, he soon built up a large consulting and hospital practice. He was a jovial companion and a most loyal colleague with high ideals. In discussion and in committee he freely expressed his opinion with foresight and wisdom. By his death we have lost an otologist of high standing with a great international reputation."

Mr. Eisinger leaves a widow and a son, Dr. George Eisinger.

HORST OERTEL

M.D. Yale

Professor Oertel, who died at the age of 84 in London on Jan. 9, was one of the last links between Virchow, the father of cellular pathology, and pathologists of the present time. He was Strathcona professor of pathology at McGill University from 1919 until 1938, and during his time he was largely responsible for the building and development of the pathological institute there. When it was opened in 1924, A. E. Boycott travelled from England to give the inaugural address.

Oertel was born at Oberlössnitz, near Dresden, and educated at schools at Plaven and Meissen. He took his medical degree in the United States, and after graduating M.D. at Yale University in 1894 he returned to Germany to begin his postgraduate study of pathology in Berlin. He found the medical school there overcrowded, and though he appreciated the teaching of men like Virchow, von Leyden, Gerhardt, and von Bergmann, he moved to Würzburg, where he acted as junior assistant to Rindfleisch and Borst. It was while working at Würzburg that Oertel decided that if he was to follow an academic career it was essential to have a preliminary training in philosophy, logic, and biology. Wundt at Leipzig was attracting students and research-workers

from all over the world, and Oertel joined them. The time spent in this stimulating and exciting atmosphere coloured his outlook for the rest of his life. Wundt made him see the events of history and the phenomena of life from an objective scientific point of view. During this stay he also studied comparative anatomy and evolution and the works of Goethe, Lessing, and Gillert.

In 1897 he returned to America and in the next ten years he held university posts before in 1907 he was appointed director of the Russell Sage Institute of Pathology, New York. In 1913 he came over to Guy's Hospital and worked on experimental nephritis and the development of the kidney. In the following year McGill University invited him to become associate professor of pathology there and pathologist to the Royal Victoria Hospital. In due course he was appointed to the chair of pathology.

W. G. B. writes:

"Oertel's contribution to pathology was his insistence that it should be studied from a philosophical point of view and its backbone be composed of a strictly causal comprehension of pathological processes based on logical objective reasoning only. This is clearly seen in the preface and introduction of the two books he wrote, *Pathology* (1927) and *Special Pathological Anatomy* (1939). His other contribution was his insistence that organs should be studied whole and that the study of the separate tissues of which an organ was composed did not represent the functional potentiality of the whole organ. He made an extensive study of tumours to show that they had the ability to excite the tissues in their neighbourhood to produce stroma, blood-supply, and a new nerve-supply. The steady flow of good papers which came from his institute was based on sound work, much of which was initiated or actually done by Oertel himself.

"Oertel was a friendly, urbane, companionable man much absorbed by pathology and philosophy; he had a great admiration for Goethe. He enjoyed good living and the company of friends. He was a bachelor and since he retired in 1938 he had lived most of the time in London at the Devonshire Club."

JAMES DOUGLAS MONTGOMERY KERR

M.D. Edin., D.P.H., D.C.H.

Dr. J. D. M. Kerr, a senior medical officer in the Edinburgh public-health department, died on Jan. 9, at the age of 32. Born and brought up in Edinburgh, he was educated at George Heriot's School and the University, where he graduated M.B. in 1946. After serving as house-surgeon at the Royal Infirmary and house-physician at the Royal Hospital for Sick Children in Edinburgh he joined the Royal Air Force. On his demobilisation in 1949, he returned to Edinburgh as a clinical assistant at the Sick Children's Hospital, and at the end of this appointment he joined the Edinburgh public-health department as an assistant medical officer in the child-welfare section. He took the D.C.H. in 1950.

His energy and enthusiasm for work among children led to his being chosen to study retrolental fibroplasia among infants born in the city. He submitted the results of his investigations as a thesis for the M.D. degree, which he obtained in 1953, and he published, with colleagues, several papers on the subject. By this time he had decided that his main interest lay in preventive medicine, and in 1954 he took the D.P.H. To enlarge his experience he worked for a time among the aged. Two months ago he was appointed a senior medical officer in the Edinburgh public-health department.

Two colleagues write: "Douglas Kerr always set himself high standards and he showed considerable keenness both in work and in sport. Already his researches had shown that he had an incisive and original mind. In sport his special interests were rugby, at which he had represented Edinburgh against Glasgow in the inter-city as well as playing for Heriot's F.P. and London Scottish, and tennis at which he also excelled. His cheerful manner and ever-present sense of humour earned him many friends not only among his associates in private and professional life but also among his patients. Love of children was a constant feature of his pædiatric and early public-health work and his enthusiasm and sympathetic understanding also won him the confidence and gratitude of the old folk."

Dr. H. S. PEMBERTON

J. G. F. writes:

"To some extent Pemberton was a difficult man to know, for he hated anyone to guess that he was a mass of kindness and emotion. He did not give his friendship easily, but having done so nobody could be more helpful or more kindly. He never forgot the slightest kindness done to him, and would return it a hundredfold; more if possible. To him all patients were the same. His job was to get them better and this he tried to do with all the skill, all the attention, and all the care he could lavish on them, and not without considerable success. He will be remembered with gratitude by many people in Liverpool and district, but particularly by the diabetics. At the time of his retirement there were over 1000 patients at his diabetic clinic, all of whom he knew by name and to each he gave individual attention. To the hundreds of doctors who in their student days were on Pem's firm he taught that medicine began with the patient, and that the patient as well as the disease must be treated. His ward rounds and outpatients were memorable, and no student ever left him without having learnt a great deal about the art of medicine."

Mr. E. R. FLINT

A. P. B. writes:

"In the 1914–18 war 'Father Flint' ran the Leeds General Infirmary's surgical beds together with 200 military beds in old Outpatients. This was made possible by his cast-iron constitution and his indomitable energy. His work in the operating-theatre was astounding. I can remember, as a student, giving 22 general anæsthetics for him for cases of the order of hernia during the afternoon and evening. He was fascinating to watch and he had rather a stumpy hand which apparently moved slowly but with such precision that the work was done speedily. He had only a student anæsthetist and two nurses to assist him, but the atmosphere of the theatre was serene and no tempers were lost. While still R.S.O. he probably opened more abdomens than any other British surgeon in his lifetime."

Appointments

EYLES, N. C., M.B., D.P.H.: asst. M.O., Hove and Portslade Health Subcommittee area.

FOWLER, P. B. S., D.M. Oxfd, M.R.C.P.: consultant physician, Chalfonts and Gerrards Cross Hospital, Bucks.

GRAHAM, J. A. G., M.B. Edin.: senior asst. county M.O., West Riding, and school M.O., Harrogate, Knaresborough, and Nidderdale.

JONES, F. T., M.B. Manc.: appointed factory doctor, Ruabon, Denbighshire.

MACKAY, D. G., M.B. Aberd.: deputy medical superintendent, Inverness group of hospitals.

NASH, JOHN, M.D. Lond., M.R.C.P.: physician-superintendent, Limerick County council.

East Anglian Regional Hospital Board:

BUSHBY, ANTHEA M., M.B. Lpool, D.A.: anæsthetic registrar, Peterborough Memorial Hospital.

GHOSH, SOBHA, M.B. Calcutta, D.G.O.: registrar in obstetrics and gynæcology, West Norfolk and King's Lynn Hospital.

GIBBON, R. H., M.B. Camb.: medical registrar, Norfolk and Norwich Hospital.

GREENBERG, M. J., M.B. Camb., M.R.C.P.: consultant chest physician, Cambridge area.

MANSOOR, I. A., M.B. Bombay: orthopædic registrar, Norfolk and Norwich Hospital.

NEEDHAM, BRENDAN, M.B. N.U.I., D.OBST.: registrar in obstetrics and gynæcology, E. Suffolk and Ipswich area.

WALSH, A. M., M.B. N.U.I., D.OBST.: registrar in obstetrics and gynæcology, Peterborough group of hospitals.

Liverpool Regional Hospital Board:

ELLIS, D. D., M.B. Belf., D.P.M.: whole-time asst. psychiatrist.

FOLEY, MARY M., M.D. N.U.I., D.C.H., D.P.H.: whole-time tuberculosis M.O., Ormskirk area.

LANCASTER, N. P., M.D. Manc., D.P.M.: whole-time asst. psychiatrist, Deva Hospital.

MARSDEN, A. J., M.B. Lpool, F.R.C.S.: part-time consultant general surgeon, Ormskirk area.

Notes and News

POISONS RULES

AMPHETAMINE and dexamphetamine have lately been added to the fourth schedule of the Poisons Rules.[1] Accordingly these drugs may now be sold by retail on prescription only.

VISITING CHILDREN IN HOSPITAL

THE Ministry of Health, which has more than once urged hospitals which admit children to allow frequent visiting,[2] has again brought this need to the notice of hospital authorities [3]; and it expresses the hope that existing arrangements for children visiting their parents in hospital will be extended.

The Ministry finds that only 10% of hospitals admitting children now restrict visiting to one day a week or less; such hospitals include 28 which still prohibit all visits except in emergencies. The Standing Medical Advisory Committee has reported to the Minister that at infectious-diseases hospitals frequent visiting, subject to safeguards, can be allowed, and indeed at some is already being allowed. The safeguards include a sufficiency of single-bed wards; enough nursing staff to supervise visiting parents; the wearing of protective clothing by visitors, and the application to them of routine measures for preventing the spread of infection; the total prohibition of visitors in the case of some diseases; and the limitation of visiting in general to parents and guardians. Many hospitals which do not allow daily visiting give as the reason the undesirability of admitting visitors on days when there are operating sessions; but the committee suggests that there is no general reason why all visiting on such days should be prohibited. The visiting of children admitted for tonsillectomy may not be necessary where the child's stay is for twenty-four hours or less; but it is undesirable for a child to be denied visitors if it is to be in hospital for three or four days. Daily visiting in mental-deficiency and other long-stay hospitals is desirable, even though this may interfere with the hospital's routine. Daily visiting should be allowed even in remote hospitals, so that parents can at least choose the most convenient days; and it would be helpful if these hospitals arranged for the shelter and refreshment of visitors and for accommodating other children whom the parents may be obliged to bring with them. Where children have to be admitted to wards for adults there is no good reason for prohibiting daily visiting, even if this arrangement differs from that for the visiting of adult patients.

The Ministry hopes that daily visiting will become the general practice of hospitals which admit children; and, it says, "it may even be that visits can be allowed more frequently than once a day."

AMŒBIASIS

A DISCUSSION by the Royal Society of Tropical Medicine and Hygiene, on Jan. 19, made it clear that amœbiasis is important in Britain, partly because the infection is quite often found in people who have never been abroad, partly because it is a common and sometimes serious cause of ill health in those who have lived in the tropics, and partly because the many drugs advocated in recent years need careful and critical assessment.

Dr. A. R. D. Adams, of Liverpool, speaking of intestinal amœbiasis only, declared that for the acute attack nothing has so far equalled emetine, that to eradicate the infection a three-week intensive course of emetine bismuth iodide should be undertaken, that of the arsenicals acetarsol is probably the best, that retention enemas of 'Chiniofon' are sometimes useful, and that the antibiotics have not justified themselves for routine treatment, and should be reserved for exceptional cases and used with care.

Prof. A. W. Woodruff and his colleagues, Dr. S. Bell and Dr. F. D. Schofield, described several hundred cases treated during several years on a careful plan to evaluate the various drugs used. Like Dr. Adams, Professor Woodruff was unequivocal that emetine bismuth iodide is at present the drug of choice in chronic intestinal amœbiasis (with emetine itself for the acute attack), and he cited a known-relapse rate of 3% in his series—possibly a rather low estimate in view of the difficulties of prolonged observation, but nevertheless comparing favourably with other courses. This team of workers also tested chloramphenicol (poor), aureomycin (poor), oxytetracycline (unsatisfactory), fumagillin (disappointing), 'Camoform' (unsatisfactory), 'Glaucarubin' (not so good as emetine bismuth iodide, but useful and cheap), and a new drug 'Entamide' (fairly useful and cheap). Some of these drugs have considerable value, but they did not stand comparison with emetine bismuth iodide; nevertheless, lack of toxicity and cheapness are factors. Prolonged use of the antibiotics may be risky.

Sir George McRobert referred to the historic importance of the introduction of emetine for amœbiasis by Sir Leonard Rogers forty-five years ago, but made the important point that emetine bismuth iodide is still too expensive for the Indian peasant. There is danger in relying on antibiotics in cases of amœbic hepatitis, which responds to emetine or chloroquine. Accurate diagnosis is supremely important, and there are distressing stories of prolonged treatment with all the latest drugs in patients who have never had the disease. Sir Philip Manson-Bahr agreed that in India and Africa the diagnosis has been grossly overdone, and he too advocated treatment with emetine bismuth iodide, as he always has done. Group-Captain W. P. Stamm thought that the toxicity of emetine has been much over-stressed, and like some other speakers he doubted the value of retention enemas. Major-General A. Sachs, and other speakers, referred to the psychological effects of an attack of acute amœbiasis—itself a condition materially affecting the health and comfort of the patient.

MOZART'S DEATH

FEW men have made such a generous contribution to music as Wolfgang Amadeus Mozart, who was born at Salzburg two hundred years ago, on Jan. 27, 1756, and who composed and played instruments at the age of five and died, at the peak of his powers, only thirty years later. Over 600 of his compositions have been published, including 20 masses, 23 operas, 49 symphonies, and 27 piano concertos.

There has been much speculation about the disease which killed Mozart at so early an age, and the many and conflicting reports have lately been discussed by Dr. B. Juhn.[1] Five of Mozart's brothers and sisters died in infancy, apparently of inanition: there was a belief in his family that children should be fed on water and not milk. His father probably died of coronary thrombosis, and his mother's death was certified as *maladie du cœur*. At a very early age Mozart began a nomadic life which was later spent in search of patronage and a living. He was desperately poor, and was in the habit of working late at night; he was dogged by worries, fears, disappointments, hunger, and illness. He had scarlet fever in 1762, typhoid fever in 1765, smallpox in 1767, an undefined febrile illness the next year, and pneumonia in 1781. Because of Mozart's active life, Dr. Juhn dismisses one suggestion that he had rheumatoid arthritis and endocarditis, and another that he had tuberculosis; it is true that at the age of six a physician found a nodular skin eruption on his shins, elbows, and buttocks which could have been erythema nodosum, but hæmolytic streptococci may have been responsible.

Mozart began to ail in the late autumn of 1791 and he believed he had been poisoned. Œdema of his hands and feet developed, and he complained that he could "taste death on his tongue"—a probable indication of excess urea and ammonia in the saliva. Attacks of dyspnœa followed, with convulsions, delirium, and severe headaches, and he died in coma on Dec. 6, 1791.

The cause of his death was certified as *Hitziges Frieselfieber* or "sweat rash," an epidemic and often fatal disease of those days; but Dr. Juhn suggests that all the evidence points to malignant nephrosclerosis producing uræmia and heart-failure: the nephrosclerosis could have been a result either of nephritis following scarlet fever, or of malignant hypertension. Some people at the time, however, thought that he had typhus, and he was buried in Vienna, in a pauper's grave, the position of which is not known.

Plans for new Hospital at Hong-Kong

The Hong-Kong government have approved plans for a new hospital of 1275 beds to be built in Kowloon. The estimated cost is £3¼ million, and when completed in 1960 it will be the biggest hospital of its kind in the Commonwealth.

1. Statutory Instruments 1955, no. 1978.
2. See *Lancet*, 1953, i, 531, 539.
3. H.M.(56)6.

1. Juhn, B. Mozart's Illness and Death. *Ciba Symposium*, February, 1956.

University of Birmingham

Mr. D. M. Morrissey has been appointed part-time lecturer in surgery, and Mr. R. F. Wrighton, PH.D., lecturer in the department of medical statistics.

University of Liverpool

At a recent examination for the degree of PH.D. in the faculty of medicine Dr. H. Wilson was successful.

University of St. Andrews

In recent examinations the followirg were successful:

M.D.—J. G. Lawson (with commendation); Harry Williams (with honours).

M.B., Ch.B.—John Armitage, Doreen M. Birley, Dorothea T. Grace, J. M. Hutchison, P. J. McDonald, R. B. Maclaren, Fergus Mitchell, Margaret E. Robinson, K. E. Walling, June P. Wilson.

Royal College of Physicians of London

On Tuesday and Thursday, Feb. 7 and 9, at 5 P.M. at the college, Pall Mall East, S.W.1, Dr. R. J. F. Schilling will deliver the Milroy lectures the subject of which will be Chronic Respiratory Disease among Cotton and Other Textile Workers.

Royal Society of Medicine

The eighth award of the Hickman medal has been made to Dr. Harold Griffith of Montreal, first president of the World Federation of Societies of Anæsthesiologists.

St. George's Hospital, London

Viscount Ingleby has been appointed chairman of the board of governors of this hospital. Lord Ingleby was formerly Mr. Osbert Peake.

Royal Appointment

Surgeon Rear-Admiral R. L. G. Proctor has been appointed an honorary physician to the Queen in succession to Surgeon Rear-Admiral S. G. Rainsford.

North of England Obstetrical and Gynæcological Society

The following officers have been elected for this society for 1956:

President, Mr. C. H. Walsh; hon. treasurer, Mr. C. H. Walsh; hon. general secretary, Mr. C. J. K. Hamilton; vice presidents, Miss E. M. Mills, Mr. J. R. Bentham, Prof. A. M. Claye, Mr. L. B. Patrick, Mr. F. E. Stabler; hon. reporting secretary, Miss U. M. Lister.

Oxford University Medical Society

The programme of this society for the hilary term includes papers by Dr. H. E. Lewis on the British North Greenland Expedition (Jan. 24), by Dr. J. H. Hunt on the future of general practice (Feb. 14), and by Sir John Charles on Our Lords and Masters (Feb. 28). All the meetings are held on Tuesdays at 8.15 P.M. at the Radcliffe Infirmary.

List of Dispensing Opticians

The annual list of members of the Guild of British Dispensing Opticians is now available. It contains 507 addresses in the United Kingdom and overseas, and indicates those where a contact lens and/or artificial-eye fitting service is available. Medical eye centres sponsored by the N.O.T.B. are also shown. A copy will be sent to any doctor on application to the secretary of the guild, 50, Nottingham Place, London, W.1.

Wellcome Museum of Medical Science

Lieut.-Colonel C. A. Bozman has been appointed director of this museum.

Colonel Bozman graduated M.B. from the University of Edinburgh in 1924 and the same year joined the Indian Medical Service. He held public-health and laboratory appointments in the service, including that of director of public health, Burma, and became a public-health commissioner to the Government of India. After his retirement in 1947 he was lecturer in public health at the University of St. Andrews, health counsellor at the British Middle East Office, Cairo, and professor of preventive medicine at the University College of East Africa (Makerere College).

CORRIGENDUM: *Conn's Syndrome with Severe Hypertension.*—In table I of last week's article by Dr. T. M. Chalmers and his colleagues (p. 127) the third column should have been headed "Cortisol in whole blood (μg. per 100 ml.) or 24 hr. urine," and the fourth column should have been headed "Aldosterone in whole blood (μg. per 100 ml.) or 24 hr. urine." Fig. 4*b* showed a collecting tubule.

The tuberoulin dispenser for use with the Heaf multiple-puncture apparatus, described by Dr. Peter Stradling (*Lancet*, 1955, ii, 252), is now obtainable from Messrs. Labex Ltd., 49, Ashtree Avenue, Mitcham, Surrey.

Diary of the Week

JAN. 29 TO FEB. 4

Monday, 30th

UNIVERSITY COLLEGE, Gower Street, W.C.1
5 P.M. Dr. A. Nizet (Liége): Hæmopoiesis and General Protein Metabolism.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5 P.M. *Comparative Medicine.* Dr. H. Churchill-Davidson, Dr. Audrey Smith, Dr. H. L. Rosomoff, Dr. B. A. Cookson, Mr. D. N. Ross, Mr. D. G. Melrose: Hypothermia.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. R. H. Girdwood: Folic Acid and Vitamin-B_{12} Deficiency in Man.

Tuesday, 31st

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. D. R. Wilkie: Living Muscle.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Lieut.-Colonel H. J. Bensted: Bacillary Dysentery.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. Denis Browne: Surgery of the Newborn.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. G. C. Wells: Disorders of Sweating.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) Prof. Michael Polanyi, F.R.S.: Passion and Controversy in Science. (University lecture.)

Wednesday, 1st

ROYAL SOCIETY OF MEDICINE
5.15 P.M. *History.* Dr. W. H. McMenemey; Alexander Philip Wilson Philip (1770–1851), physiologist and physician.
8 P.M. *Surgery and Anæsthetics.* Dr. B. G. B. Lucas, Sir Russell Brock, Mr. S. M. Cohen: Application of Hypothermia to Surgical Procedures.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. A. Cochrane: Detection of Tuberculosis in a Community.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. O. Oliver: Blood and Bone-marrow in Skin Diseases.

BIRMINGHAM MEDICAL INSTITUTE, 154, Great Charles Street, Birmingham
8.15 P.M. *Midland Medical Society Section.* Dr. A. M. Nussey, Dr. D. L. Crombie, Mr. Fauset Welsh, Dr. K. B. Rogers: Antibiotics.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (Royal College of Surgeons, 18, Nicolson Street, Edinburgh.) Dr. I. Simson Hall: Deafness as a Social and Industrial Disability.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, St. Vincent Street, Glasgow
5 P.M. Prof. C. Heymans: Regulation of Blood-pressure and Hypertension. (Finlayson lecture.)

Thursday, 2nd

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.2
5.30 P.M. Sir Philip Manson-Bahr: Tropical Diseases affecting the Throat, Nose, and Ear.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Mr. S. V. Perry, PH.D.: Proteins in Muscular Contraction.

UNIVERSITY OF LONDON
5 P.M. (St. Thomas's Hospital Medical School, Albert Embankment, S.E.1.) Prof. A. Jost (Paris): Hormonal Control of Sexual Differentiation in the Mammalian Fœtus.

ROYAL SOCIETY OF MEDICINE
8 P.M. *Neurology.* Dr. Macdonald Critchley: Premorbid Literacy and the Pattern of Subsequent Aphasia.

MANCHESTER MEDICAL SOCIETY
8 P.M. *Anæsthetics.* Dr. F. W. Oliver: Carbon-dioxide Concentrations in Anæsthetic Apparatus. Dr. E. G. Rees Jones: The Anæsthetist in Obstetrics.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Dundee.) Prof. C. A. Keele: Production of Pain by Chemical Substances.

Friday, 3rd

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Mr. I. P. J. MacNaughtan, Mr. Terence Cawthorne: Chronic Adhesive Otitis Media.
2.30 P.M. *Laryngology.* Mr. N. R. Barrett, Prof. P. R. Allison, Prof. A. S. Johnstone, Dr. R. E. Bonham-Carter: Unusual Aspects of Œsophageal Disease.

POSTGRADUATE MEDICAL SCHOOL OF LONDON
4 P.M. Dr. P. McG. Moffatt: Fundus Conditions in General Diseases.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. L. Forman: Diseases of the Nails.

MIDLAND CENTRE FOR NEUROSURGERY, Holly Lane, Smethwick
8.15 P.M. Mr. J. B. Fennybacker: Compression of the Cauda Equina.

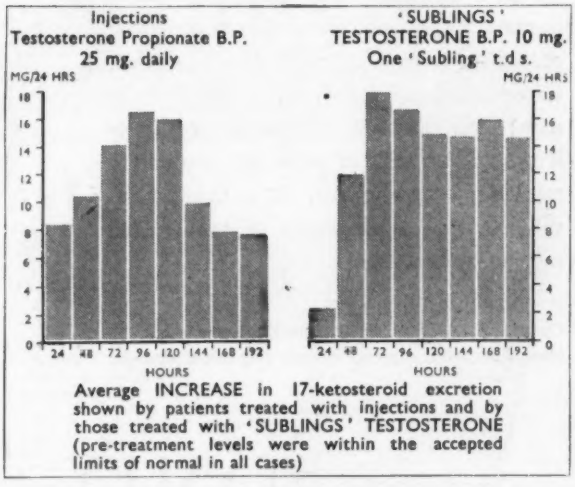
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW
8.30 P.M. (Royal Faculty of Physicians and Surgeons of Glasgow.) Prof. C. A. Wells: Surgery in the Treatment of Hypertension.

nature's androgen
TESTOSTERONE BP

without injection

'SUBLINGS'
of
TESTOSTERONE 10 mg.

clinically effective and produce a 17-ketosteroid excretion rate COMPARABLE TO THAT FROM THE SAME DOSAGE OF INJECTED TESTOSTERONE PROPIONATE



Average INCREASE in 17-ketosteroid excretion shown by patients treated with injections and by those treated with 'SUBLINGS' TESTOSTERONE (pre-treatment levels were within the accepted limits of normal in all cases)

In Males

Supplementary Therapy :

(1) Depression and Debility in middle-aged males where androgen therapy is indicated.
1 - 2 Sublings daily.

Full Replacement Therapy :

(2) As in Eunuchism and Eunuchoidism, etc.
1 Subling thrice daily.

In Females

(1) Excessive Functional Uterine Bleeding :
1 - 3 Sublings daily for 3 - 4 days.
(2) Inoperable Mammary Carcinoma :
2 - 6 Sublings daily.

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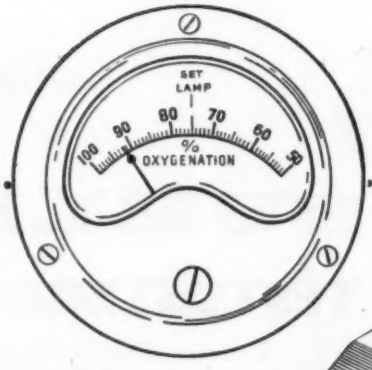

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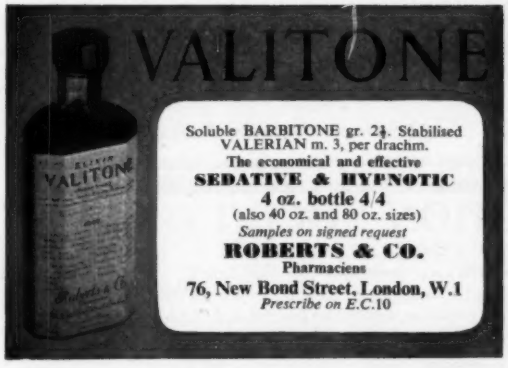

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION — Page 34

ADMINISTRATIVE
Welsh R.H.B. M.O. 35

ANÆSTHETICS
London, E.1, & North East Met. R.H.B. Sr. Reg. 37
St. Thomas's, S.E.1. Reg. 37
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. or H.O. 39
Carshalton. St. Helier. Sr. Reg. .. 39
Edgware Gen. Sr. Reg. 40
Edinburgh. Northern Group of Hosps. H.O. 40
Luton & Dunstable. Reg. 42
Manchester R.H.B. Reg. 42
Orpington, Kent. Sr. H.O. 43
Oxford R.H.B. Sr. H.M.O. 35
Plymouth. South Devon & East Cornwall. Sr. H.O. 43
Portsmouth Group H.M.C. Sr. Reg. 43
Scotland. Northern R.H.B. Locum Sr. H.M.O. 35
Scotland. Northern R.H.B. Reg. .. 44
Sidcup. Queen Mary's. Sr. H.O. .. 44
Slough. Upton. Locum Reg. .. 43
St. Albans City. Locum Reg. .. 44
Ethiopia. Princess Tsahai Mem., Addis Ababa. Anæs. 36
U.S.A. Cambridge, Mass. Residencies 45

CARDIOLOGY
Royal Free, W.C.1. Sr. Reg... .. 37

CASUALTY
Central Middlesex, N.W.10. Sr. H.O. 36
Connaught, E.17. Sr. H.O. 36
Hackney, E.9. H.O. 36
North Middlesex, N.18. Sr. H.O. .. 37
Aylesbury. Royal Bucks. Sr. H.O... 38
Brighton Gen. H.O. 39
Bromley, Kent. Sr. H.O. 39
Chelmsford & Essex. Sr. H.O. .. 39
Chesterfield Royal. Sr. H.O... .. 40
Hastings. Royal East Sussex. Sr. H.O. 41
Hemel Hempstead. West Herts. Jr. H.M.O. 41
Hertford County. Sr. H.O. 41
Hitchin Hosps. Sr. H.O. 41
Hounslow, Middx. Sr. H.O. 41
Manchester R.H.B. Sr. Casualty Officer 35
Newcastle R.H.B. Sr. Casualty Officer 35
Nottingham Gen. Sr. H.O. 43
Perth County & City Gen. Hosps. H.O. 43
Stafford. Staffordshire Gen. Infy. Jr. H.M.O. 44
Watford Peace Mem. Sr. H.O. .. 45

CHEST AND TUBERCULOSIS
Brompton, S.W.3. Sr. H.O. & H.O.'s 36
Hammersmith Hosp. & P.G. Med. School, W.12. Reg. 36
London Chest, E.2. H.O.'s 37
Ashford, Middx. Sr. H.O. 38
Edinburgh. Northern Group of Hosps. H.O... 40
Maidstone. Preston Hall. Jr. H.M.O. 42
Market Drayton. Cheshire Joint San. Jr. H.M.O. or Sr. H.O. 42

Midhurst. King Edward VII San. Asst. M.O. 42
Newcastle Gen. Sr. H.O. 42
North East Met. R.H.B. Reg. .. 37
Scotland. Northern R.H.B. Jr. H.M.O. 44
South East Northumberland H.M.C. Jr. H.M.O. or Sr. H.O. 44
Welsh R.H.B. Sr. H.M.O. 35

DERMATOLOGY
St. John's Hosp. for Diseases of the Skin, W.C.2. Sr. H.O. 37

EAR, NOSE, AND THROAT
St. Bartholomew's, E.C.1. Sr. Reg. .. 37
Whipps Cross, E.11. Sr. H.O. .. 38
Birmingham & Midland Ear & Throat. Sr. H.O. or H.O. 39
Grimsby Gen. Sr. H.O. 40
Manchester United Hosps. Reg. .. 42
Reading. Royal Berks. H.O. .. 43

GERIATRICS
Ashton, Hyde & Glossop H.M.C. Jr. H.M.O. 38
Brighton Gen. H.O. 39
Hull. Kingston Gen. Sr. H.O. .. 41
Leeds R.H.B. Reg. 41
North East Met. R.H.B. Reg. .. 37
Southampton Group of Hosps. Reg. 43

HÆMATOLOGY
Sheffield R.H.B. Deputy Director .. 35

INFECTIOUS DISEASES
Neasden, N.W.10. Reg. 37
Glasgow. Belvidere I. D. Jr. H.M.O. 40
Leeds R.H.B. Sr. H.M.O. 35
Middlesbrough. West Lane. Jr. H.M.O. 42

MEDICINE
Connaught, E.17. H.O. 36
Hampstead Gen., N.W.3. Sr. Reg. .. 36
North East Met. R.H.B. Reg. .. 37
North East Met. R.H.B. Sr. Reg. .. 37
Ashford, Middx. H.O. 38
Birmingham R.H.B. Reg. 38
Carluke, Lanarkshire. Law. H.O. .. 39
Chertsey. St. Peter's. Reg. 40
Colchester H.M.C. H.O. 40
East Anglian R.H.B. Reg. 40
Edgware Gen. H.O. 40
Edinburgh. Astley Ainslie. Jr. H.M.O. 40
Exeter. Royal Devon & Exeter. H.O.'s 40
Hastings. St. Helen's. H.O. 41
Hillingdon, Middx. H.O.'s 40
Hull. Kingston Gen. Pre-reg. H.O. .. 41
Leeds R.H.B. Regs. 41
Louth. County Infy. Sr. H.O. .. 42
Luton. St. Mary's. Locum Sr. H.O. 42
Lymington, Hants. Sr. H.O. .. 42
Manchester United Hosps. Sr. Reg. & Reg. 42
Newcastle R.H.B. Reg. 42
Nottingham Gen. Pre-reg. H.O. .. 43
Portsmouth Group H.M.C. Pre-reg. H.O.'s 43
Stoke-on-Trent. North Staffs Royal Infy. H.O. & Pre-reg. H.O. .. 45
Dublin. Jervis Street. Reg. 45

NEUROSURGERY
Regional Neurosurgical Centre, S.E.18. Sr. H.O. 37
Leeds United Hosps. Sr. H.O. .. 41

OBSTETRICS AND GYNÆCOLOGY
Elizabeth Garrett Anderson, N.W.1. H.O. 36
Mothers' (Salvation Army), E.5. Pre-reg. H.O. & H.O. 37
North East Met. R.H.B. Reg. .. 37
Royal Free Hosp. Group. Locum P.-t. Cons. 35
Royal London Homœopathic, W.C.1. H.O. 37
South London Hosp. for Women & Child., S.W.4. Reg. 38
St. Bartholomew's, E.C.1, & North East Met. R.H.B. Sr. Reg. .. 37
St. Teresa's Maternity, S.W.20. H.O. or Sr. H.O. 37
Barking (Maternity). Sr. H.O. .. 38
Birmingham. Dudley Road. Sr. H.O. 39
Birmingham R.H.B. Reg. 38
Birmingham. Solihull. Pre-reg. H.O. 38
Bushey Maternity. H.O. 39
Derby. Derbyshire Royal Infy. Pre-reg. H.O. or Sr. H.O. 40
Doncaster. Western. Reg. 40
Ilford Maternity. Sr. H.O. 41
Liverpool United Hosps. Sr. H.O. .. 42
Newcastle United Hosps. Sr. H.O. .. 43
Pontypridd, East Glamorgan. Sr. H.O. 43
Reading. Royal Berks. H.O. .. 43
Scotland. Western R.H.B. Sr. H.O. 44
Sunderland Royal Infy. H.O. .. 44
Taplow. Canadian Red Cross Mem. H.O. 45
Watford Maternity. Sr. H.O. .. 45

OPHTHALMOLOGY
Royal Eye, S.E.1. Sr. H.O. 37
Birmingham R.H.B. Reg. 38
Broxburn. Bangour Gen. Sr. H.O. .. 39
East Anglian R.H.B. P.-t. Cons. .. 35
Manchester United Hosps. Sr. Reg. & Sr. H.O. 42
Manchester United Hosps. Sr. H.M.O. 35
Oxford United Hosps. Sr. H.O. .. 43

ORTHOPÆDICS
Bournemouth. Royal Victoria. Sr. H.O. 39
Brighton & Lewes H.M.C. Locum Reg. 39
Chertsey. St. Peter's. Sr. H.O. or Pre-reg. H.O. 39
Colchester H.M.C. H.O. 40
Durham County. Pre-reg. H.O. .. 40
Manchester United Hosps. P.-t. Sr. H.M.O. 35
Perth County & City Gen. Hosps. H.O. & Sr. H.O. 43
Portsmouth Group H.M.C. Pre-reg. H.O. 43
Scotland. North-Eastern R.H.B. Sr. Reg. 44
Scotland. Northern R.H.B. Reg. .. 44
Southampton. Royal South Hants. Sr. H.O. & H.O. 44
Stoke-on-Trent. North Staffs Royal Infy. H.O. 44
Winchester Group H.M.C. Reg. .. 45

PÆDIATRICS
Hosp. for Sick Child., W.C.1. Reg. .. 38
St. George's, S.W.1. Sr. H.O. .. 37
Ashton, Hyde & Glossop H.M.C. H.O. 38
Bolton Dist. Gen. H.O. 39
Hillingdon, Middx. H.O. 40
Liverpool United Hosps. & R.H.B. Sr. Reg. 42
Stockton-on-Tees. Child's. Sr. H.O. 44
Stoke-on-Trent. City Gen. Pre-reg. H.O. 44
Welsh R.H.B. Reg. 45

PATHOLOGY
Elizabeth Garrett Anderson, N.W.1. Sr. H.O. 36
South London Hosp. for Women & Child., S.W.4. Sr. H.O. 38
Bath H.M.C. Sr. H.O. 38
Beverley. Westwood. Sr. H.O. .. 38
Birmingham R.H.B. Reg. 38
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. 39
Manchester. Withington. Sr. H.O. .. 42
Rotherham Clinical Lab. Reg. .. 43
Sheffield United Hosps. Sr. H.O. .. 44
Watford. Group 9. Pathological Lab. Sr. H.O. 45
Western Australia. Royal Perth. Sr. Path. 36

PLASTIC SURGERY
Windsor Group of Hosps. Sr. H.O. .. 45

PSYCHIATRY
North East Met. R.H.B. & St. Bart's, E.C.1. Sr. Reg. 37
Beverley. Broadgate. Jr. H.M.O. .. 38
Birmingham. All Saints Hosp. Sr. Reg. 38
Birmingham. Rubery Hill. Reg. .. 38
Bournemouth. St. Ann's. Jr. H.M.O. 39
Bromsgrove, Worcs. Barnsley Hall. Jr. H.M.O. 39
Bury & Rossendale H.M.C. Jr. H.M.O. 39
Chesterfield H.M.C. Jr. H.M.O. .. 40
Epsom. West Park. Locum Sr. H.M.O. 35
Leeds R.H.B. Regs. 41
Lincoln. Harmston Hall. Jr. H.M.O. 41
Liverpool. Moss Side. Jr. H.M.O. or Reg. 41
Macclesfield. Parkside Mental. Reg. 42
Nottingham. Saxondale. Reg. .. 42
Sheffield R.H.B. Sr. Reg. 44
Sheffield United Hosps. Reg. .. 44
South West Met. R.H.B. Cons. .. 35
Warwick. Central Mental. Sr. H.O. 45
Welsh R.H.B. Reg. 45

RADIOLOGY
East Anglian R.H.B. Reg. 40
Leeds United Hosps. Reg. 41
Portsmouth Group H.M.C. Reg. .. 43
Scotland. South-Eastern R.H.B. Cons. 35
Scotland. South-Eastern R.H.B. Reg. 44
Sheffield United Hosps. Reg. .. 44
Dublin. National Mass-Radiography Assoc. Asst. Med. Director .. 36
South Africa. Provincial Admin. of Cape of Good Hope. Med. Pract's. (Grade F. E. & D.) 36
Western Australia. Royal Perth. Director 36

RADIOTHERAPY
Cambridge. Addenbrooke's. Reg. .. 39
Leeds United Hosps. Sr. H.O. .. 41

SURGERY
Highlands Gen., N.21. H.O. 37
New End, N.W.3. Reg. 37
Putney, S.W.15. H.O. 37
St. Andrew's, E.3. H.O. 37
Wanstead, E.11. H.O. 38
Aberystwyth Gen. Sr. H.O. 38
Aylesbury. Tindal Gen. H.O. .. 38
Barrow-in-Furness. North Lonsdale. Sr. H.O. 38
Bedford Gen. Pre-reg. H.O. 38
Birmingham Accident. H.O. .. 39
Birmingham R.H.B. Reg. 38
Blackpool. Victoria. Pre-reg. H.O. .. 39
Boston. Gen. Reg. 39
Bristol. Cossham & Frenchay H.M.C. H.O.'s 39
Cambridge. Addenbrooke's. H.O. .. 39
Chesterfield Royal. H.O. 40
Chester Royal Infy. H.O. 39
Colchester H.M.C. H.O. 40
Derby City. Pre-reg. H.O. or Sr. H.O. 40
Dorchester, Dorset County. H.O. .. 40
Edinburgh. Chalmers. Sr. H.O. .. 40
Epsom Dist. Pre-reg. H.O. 40
Gt. Yarmouth & Gorleston Gen. H.O. 40
Halifax Royal Infy. Sr. H.O. .. 41
Haslemere & Dist. H.O. 41
Hastings. Royal East Sussex. Pre-reg. H.O. 41
Hastings. St. Helen's. Pre-reg. H.O. 41
Hemel Hempstead. West Herts. Pre-reg. H.O. 41
Hertford County. H.O. 40
Hove Gen. H.O. 41
Huddersfield Royal Infy. H.O. .. 41
Hull. Kingston Gen. H.O. 41
Ipswich & East Suffolk. H.O. .. 41
Leeds R.H.B. Regs. 41
Liverpool, Mossley Hill. Jr. H.M.O. 41
Maidenhead. Reg. 42
Manchester. West Manchester H.M.C. Pre-reg. H.O. 42
Newry, Co. Down. Daisy Hill. Pre-reg. H.O.'s 42
North East Met. R.H.B. Reg. .. 37
Oxford Univ. & United Hosps. Sr. Reg. 43
Pontypridd. East Glamorgan. H.O. 43
Portsmouth Group H.M.C. Pre-reg. H.O.'s 43
Reading. Royal Berks. H.O. .. 43
Redhill County. Pre-reg. H.O. .. 43
Romford. Rush Green. H.O. .. 43
Scunthorpe War Mem. Sr. H.O. .. 44
Shrewsbury. Royal Salop Infy./Copthorne. H.O. 44
South East Northumberland H.M.C. Pre-reg. H.O.'s 44
Stockport Infy. Sr. H.O. 44
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 44
Taplow. Canadian Red Cross Mem. Pre-reg. H.O. 45
Welsh R.H.B. Reg. 45
West Bromwich & Dist. Gen. Pre-reg. H.O. 45
Weymouth & Dist. H.O. 45
Winchester. Royal Hants County. H.O. 45
Workington Infy. Pre-reg. H.O. or Sr. H.O. 45
Wrexham. Maelor Gen. Pre-reg. H.O. 45
Wrexham. War Mem. Pre-reg. H.O. 45
Dublin. Jervis Street. Reg. 45
Dublin. St. Vincent's. Hon. Asst. Surgeon 36
Northern Ireland Hosps. Auth. Reg. 45

THORACIC SURGERY
Birmingham. Yardley Green. Sr. H.O. 38
Edinburgh. Northern Group of Hosps. H.O. 40

UROLOGY
St. Peter's, St. Paul's & St. Philip's Hosps. Sr. Reg. 37
Newcastle Gen. Sr. H.O. 42

VENEREOLOGY
Guy's, S.E.1. P.-t. Cons. 35

GENERAL
U.S.A. Bethesda. Cincinnati. Rotating Interns. 45

PUBLIC APPOINTMENTS 45
GENERAL PRACTICE 46
NON-MEDICAL 46
MISCELLANEOUS 46

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

RICHARD SELWYN FRANCIS SCHILLING, Esq., M.D., M.R.C.P., will deliver the MILROY LECTURES on TUESDAY, 7TH, and THURSDAY, 9TH FEBRUARY, 1956, at 5 P.M. at the College, Pall Mall East, S.W.1.

Subject: "Chronic Respiratory Disease among Cotton and other Textile Workers."

Any member of the Medical Profession admitted on presentation of card.

By order of the President.
HAROLD BOLDERO, Registrar.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The next EXAMINATION for the MEMBERSHIP will commence on MONDAY, 19TH MARCH, 1956.

Prospective candidates are asked to note that entries accompanied by the certificates, testimonials, and the examination fee of 15 guineas as required by the by-laws, must reach the College not later than first post on Monday, 20th February, 1956. Candidates must have been qualified for 18 months.

Candidates who propose to submit published work under the regulations are required to give 28 days notice, and should apply in writing to the Registrar, without delay, for detailed instructions as to the procedure they should follow. Completed entries for published work must also reach the College not later than first post on Monday, 20th February, 1956.

HAROLD BOLDERO, D.M., Registrar.
12, Pall Mall East, London, S.W.1.

FACULTY OF ANÆSTHETISTS
ROYAL COLLEGE OF SURGEONS OF ENGLAND

BOARD OF FACULTY ELECTION, 1956

Notice is hereby given that an election of 3 FELLOWS to the Board will take place on WEDNESDAY, 14TH MARCH, 1956, at 3.30 P.M. The following are the candidates for election.

Boyle, Andrew Kerr (Fellow 1953).
Brennan, Henry Joseph (Fellow 1948).
Crawford, James Henry (Fellow 1953).
Hall, Vernon Frederick (Fellow 1948).
Jarman, Ronald (Fellow 1948).
Johnson, Bernard Richard Millar (Fellow 1948).
Murtagh, Bernard Leo Salmon (Fellow 1948).
Organe, Geoffrey Stephen William (Fellow 1948).
Parry Brown, Arthur Ivor (Fellow 1949).
Wynter, Tamsin Mary (Fellow 1953).

W. F. DAVIS, Secretary.
Lincoln's Inn-fields, London, W.C.2.

UNIVERSITY OF LONDON
INSTITUTE OF ORTHOPÆDICS
Royal National Orthopædic Hospital
234, Great Portland-street, W.1

COURSE ON ADVANCED CLINICAL ORTHOPÆDICS
13TH–18TH FEBRUARY, 1956

MONDAY, 13TH FEBRUARY, TOWN SECTION
Slipped femoral epiphysis .. .. Mr. H. J. BURROWS
Arthrodesis of the great toe joint .. Mr. D. TREVOR
Surgical reconstruction of the upper limb .. Mr. H. J. SEDDON

TUESDAY, 14TH FEBRUARY, TOWN SECTION
Diagnosis of bone tumours .. .. Dr. H. A. SISSONS, Dr. F. C. GOLDING, Mr. J. N. WILSON
Vascular disease in the limbs .. Mr. G. L. W. BONNEY
Medical aspects of joint tuberculosis .. Dr. F. H. STEVENSON

WEDNESDAY, 15TH FEBRUARY, COUNTRY SECTION
Clinical demonstration .. .. Mr. A. T. FRIPP
Respiratory paralysis in polio-myelitis .. Dr. A. B. KINNIER-WILSON

THURSDAY, 16TH FEBRUARY, COUNTRY SECTION
Physiotherapy in poliomyelitis .. Mr. O. R. NICHOLSON and Miss L. M. PRIOR
Clinical demonstration .. .. Mr. K. I. NISSEN

FRIDAY, 17TH FEBRUARY, COUNTRY SECTION
Discussion on fractures .. .. Mr. J. N. WILSON
Pathology of bone tuberculosis .. Dr. A. G. TOWERS
Biochemical investigation of general bone disease .. Dr. P. G. WALKER

SATURDAY, 18TH FEBRUARY, TOWN SECTION
The Reticuloses .. .. .. Dr. H. A. SISSONS, Dr. E. H. ALLEN

The fee for this course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
(UNIVERSITY OF LONDON)
330/332, Gray's Inn-road, London, W.C.1

ADVANCED REVISION COURSE for Final F.R.C.S. students; 6TH FEBRUARY–21ST APRIL, 1956. Arranged as part-time course (mostly evenings) to meet circumstances of students holding appointments. Fee £21.

BASIC SCIENCES CLASS (whole-time) for Part I D.L.O. students, with facilities for dissection; 27TH FEBRUARY–26TH MAY, 1956. Fee £21.

WEEK-END COURSE IN PATHOLOGY of the ear, nose, and throat (intended for practising Pathologists and Oto-rhinolaryngologists and for senior trainees); 18TH and 19TH MAY, 1956. Fee £3 3s.

COURSE FOR MEDICAL OFFICERS OF HEALTH (especially those concerned with Maternal and Child Welfare) and School Medical Officers on the deaf child—early diagnosis; care and training; parent education, on 7TH, 8TH, and 9TH MARCH, 1956. Fee £4 4s.

Detailed syllabus obtainable from the Dean.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE
DEPARTMENT OF MEDICAL STATISTICS AND EPIDEMIOLOGY

A COURSE in the APPLICATION OF STATISTICAL METHODS TO MEDICINE AND EPIDEMIOLOGY will be held in MARCH–JUNE, 1956, (upon Tuesdays and Thursdays from Tuesday, 6th March, to Tuesday, 26th June, inclusive, from 10 A.M. to 3 P.M.). Students without a medical qualification can be accepted.

Applications for admission must be made before 27th February. Details of the syllabus of this course can be obtained on request.

Fee for the Course 15 guineas.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

GENERAL SURGERY

A 3 months course of post-graduate surgery suitable for surgeons requiring a refresher course in the current outlook on general surgery or for graduates preparing to specialise in surgery, starts on 19TH MARCH and 1ST OCTOBER, 1956. The programme has been re-organised so as to provide coördinated clinical and systematic instruction in general surgery wards and specialised surgical units in Edinburgh. Fee £31 10s.

MEDICAL SCIENCES

A 3 months course in Applied Anatomy, Physiology, Pathology, Bacteriology and Biochemistry will begin on 25TH JUNE, 1956. This course is suitable for post-graduates wishing to take the Primary Fellowship Examination, as a final preparation in these subjects. Considerable basic knowledge is highly desirable prior to taking this course. Fee £31 10s.

A course in the Basic Sciences (Anatomy, Physiology, Pathology, including Bacteriology) will be conducted by the Fellows of the Royal College of Surgeons, and others, under the ægis of the Edinburgh Post-graduate Board for Medicine. This course, comprising lectures and demonstrations, will begin on 15TH OCTOBER, 1956, and continue for 10 weeks. Fee £26 5s.

INTERNAL MEDICINE

Courses lasting 12 weeks, suitable for graduates wishing a refresher course, or to specialise in Medicine, begin on 26TH MARCH and 24TH SEPTEMBER, 1956. These courses consist of 320 hours instruction, comprising lectures, clinical demonstrations and ward visits. Fee £31 10s.

Additional instruction in Clinical Pædiatrics and in Tropical Medicine is arranged in conjunction with the course in Medicine, for which there is a small fee; the numbers are limited.

Applications for enrolment should be addressed to the Director of Post-Graduate Studies, Surgeons' Hall, Edinburgh, 8, supplying particulars of qualifications and post-graduate experience.

ROYAL SOCIETY AND NUFFIELD FOUNDATION COMMONWEALTH BURSARIES

Applications are invited for awards under the Royal Society and Nuffield Foundation Commonwealth Bursaries Scheme which was instituted to provide facilities for increasing the efficiency of scientists of proven worth by enabling them to pursue research, learn techniques or follow other forms of study in natural science in countries other than their own in the Commonwealth where the physical or personal environment or both are peculiarly favourable.

The bursaries provide travel, maintenance at a rate of about £600 a year depending on living costs and the applicant's circumstances and are tenable usually for periods of 2–12 months; they are not intended to provide any salary as such. Bursars will not be permitted to prepare specifically for, or to take examinations for, higher degrees or diplomas.

For proposed visits beginning during the period from July to December, 1956, applications must be received complete with supporting documents not later than 15th March, 1956, by the Assistant Secretary, The Royal Society, Burlington House, London, W.1, from whom application forms and fuller particulars may be obtained.

UNIVERSITY OF LONDON

A LECTURE on "The Hormonal Control of Sexual Differentiation in the Mammalian Fœtus" will be given by Prof. A. JOST (Paris) at 5 P.M. on 2ND FEBRUARY at St. Thomas's Hospital Medical School, Albert Embankment, S.E.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF LONDON

A LECTURE on "Some Recent Aspects of Diene Synthesis" will be given by Prof. K. ALDER (Cologne) at 5.30 P.M., on 6TH FEBRUARY at University College (Chemistry Theatre), Gower-street, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

MARLBOROUGH DAY HOSPITAL
38, Marlborough-place, N.W.8

Medical practitioners and professional people working in the mental health field are cordially invited to LECTURES held at the above on the first MONDAY of every month at 8.15 P.M.

On MONDAY, 6TH FEBRUARY, Dr. A. A. MASON will be speaking on: "The Use of Hypnosis in Psychosomatic Disorders."

UNIVERSITY OF EDINBURGH. Department of Pathology. Applications are invited for the post of LECTURER in the Department of Pathology. Salary scale £1000–£100–£1600 p.a., with placement according to experience and qualifications, and with superannuation benefit and family allowance where applicable.

Further particulars may be obtained from the undersigned, with whom applications, giving the names of 2 referees, should be lodged not later than 25th February, 1956.

CHARLES H. STEWART, Secretary to the University.

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 2ND JULY, 1956. The following Examination will be held in December, 1956.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for 2 posts in the Department of Physiology from :—

Medically qualified candidates : as an ASSISTANT LECTURER at an initial salary of £700 p.a. or as a LECTURER at an initial salary within the range £1000–£1200 p.a., according to qualifications and experience ; or from

Non-medically qualified candidates : as an ASSISTANT LECTURER at an initial salary of £550 p.a. (in special circumstances £600 p.a.) or as a LECTURER at an initial salary within the range £650–£800 p.a., according to qualifications and experience.

Applications, stating age, academic qualifications and experience, together with the names of 3 referees, should be received not later than 11th February, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. STANLEY DUMBELL, Registrar.

PAKISTAN HIGH COMMISSION. Applications are invited for the PROFESSORSHIPS OF ANATOMY, PHYSIOLOGY, and PHARMACOLOGY for a new Medical College to be established at Chittagong, East Bengal.

Qualifications : Postgraduate degree or diploma plus considerable teaching experience. Minimum age 36. Salary according to qualifications and experience. Free first-class passages and unfurnished quarters for successful candidates and families. Leave at 1/11th of service. Provident fund available.

Contract : 3–5 years in first instance. No private practice permitted.

Application forms and further particulars from the Recruitment Officer, Education Division, Pakistan High Commission, 39, Lowndes-square, S.W.1.

Hospital Services : Senior Appointments

GUY'S HOSPITAL, S.E.1. The Board of Governors invites applications for the appointment of DIRECTOR of the Department of Venereal Diseases. The appointment is of Consultant status in the National Health Service, and attendance will be required on 3 sessions a week. Applicants are required to hold higher qualifications.

Applications (1 copy), together with the names of 3 referees, should be submitted to reach the Superintendent, Guy's Hospital, London, S.E.1, not later than 17th February. In accordance with Statutory Instrument No. 1259 of the National Health Service Regulations, canvassing members of the Board or Advisory Appointments Committee will lead to disqualification.

ROYAL FREE HOSPITAL GROUP. Elizabeth Garrett ANDERSON HOSPITAL. Applications are invited from registered medical practitioners for the appointment of Locum GYNÆCOLOGICAL SURGEON (Consultant 2 sessions per week) for approximately 3 months.

Applications, with the names of 3 referees, should be sent as soon as possible to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT OPHTHALMIC SURGEONS (2) (8 notional half-days), Norfolk and Norwich Hospital Group. Main hospital Norfolk and Norwich (441 Beds). Wide experience and higher qualification essential.

Applications (8 copies), stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 6th February, 1956. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

EPSOM, SURREY. WEST PARK HOSPITAL. Locum Tenens Whole-time SENIOR HOSPITAL MEDICAL OFFICER in Psychiatry required. Salary 31½ guineas per week.

Applications, with full particulars and names of 3 referees, should be sent to the Physician-Superintendent at the Hospital as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD.

Whole-time appointment of ASSISTANT PHYSICIAN for Infectious Diseases (Senior Hospital Medical Officer scale) for duties mainly at the Seacroft Hospital, Leeds. The successful candidate will work under the supervision of the Consultant in Infectious Diseases and will be required to reside at the Hospital.

Applications (12 copies), stating age, qualifications, and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 28th February, 1956.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of Full-time SENIOR HOSPITAL MEDICAL OFFICER (non-resident). Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications to be made on forms obtainable from the undersigned as soon as possible.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER FOOT HOSPITAL. Applications are invited for the post of ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer) to commence as soon as possible for 1 session per week.

Applications (12 copies), together with the names of 3 referees, should be sent to the undersigned not later than 10th February, 1956. F. J. CABLE, Secretary to the Board of Governors.

United Manchester Hospitals,
Manchester Royal Infirmary, Manchester, 13.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time SENIOR CASUALTY OFFICER at Preston Royal Infirmary—resident or non-resident. Appointee will work under general supervision of Consultants. Tenure of post limited to 4 years. Salary within range £1500–£50–£1950 (according to experience, &c.).

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 13th February, 1956.

NEWCASTLE REGIONAL HOSPITAL BOARD. TEESSIDE HOSPITAL MANAGEMENT COMMITTEE. (Population 350,000.) **STOCKTON AND THORNABY HOSPITAL.** (130 Beds.) SENIOR CASUALTY OFFICER (whole-time). Duration of tenure of post not exceeding 4 years. The Senior Casualty Officer will be required, subject to the supervision of the Senior Surgeon to General Surgical Clinic No. 3 and the Senior Orthopædic Surgeon, to organise the work of the busy Casualty Department. The Senior Casualty Officer must reside near the Stockton and Thornaby Hospital. Further particulars may be obtained from the Senior Surgeon, General Surgical Clinic No. 3 at the Stockton and Thornaby Hospital, Stockton-on-Tees.

Applications, with names and addresses of 3 referees, to be forwarded to Deputy Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

OXFORD REGIONAL HOSPITAL BOARD. Assistant ANÆSTHETIST (whole-time), Senior Hospital Medical Officer grade, to the hospitals of the Northampton Hospital Management Committee. Applicants should hold a higher qualification in anæsthetics. The successful candidate will be required to live in or near Northampton General Hospital.

Applications (10 copies), stating age, qualifications, experience, and the names and addresses of 3 referees, should reach the Secretary, 43, Banbury-road, Oxford, by 25th February, 1956.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer grade) required for a minimum period of 9 months. Main duties are at the Royal Northern Infirmary and Raigmore Hospital, Inverness. Salary is at the rate of 31½ guineas per week.

Forms of application are available from the undersigned to whom applications should be submitted by 10th February, 1956.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time appointment of CONSULTANT in Radiodiagnosis for duty in the Edinburgh Northern Group of hospitals, vacant on 1st April, 1956. The group includes general hospitals and also the main Regional Radiotherapy Unit. A radiological service is also provided for the Royal Victoria Group of hospitals.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 25th February, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Regional BLOOD TRANSFUSION CENTRE, Northfield-road, SHEFFIELD, 10. Whole-time NON-RESIDENT DEPUTY DIRECTOR required for Regional Blood Transfusion Service. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 25th February.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time RESIDENT MEDICAL DIRECTOR AND CONSULTANT PSYCHIATRIST at Roffey Park Rehabilitation Centre, Horsham, Sussex, a neurosis centre with 120 beds and a turnover of 800 cases per year. Candidates should possess D.P.M. and preferably a higher medical qualification and should have had wide experience in psychiatry and in modern methods of treatment. Experience of social and or industrial psychiatry would be an advantage. Flat within Hospital building at moderate rental.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 24th February, 1956. Applicants may visit Centre by local arrangement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the full-time appointment of MEDICAL OFFICER on the Headquarters permanent staff. Salary £1415 (at age 33 or over) by £50 (4)–£65 (1)–£1680 p.a. The commencing salary will be abated in the case of a successful applicant under 33 years of age. The duties of the officer will be concerned in assisting in the administration of the Hospital and Specialist Services provided by the Board, as may be assigned to him from time to time by the Board's Senior Administrative Medical Officer. The appointment is subject to the provisions of the National Health Service superannuation regulations, and to the passing of a medical examination.

Applications (including a statement of the candidates age, qualifications and experience and the names of 3 referees) should be received by the undersigned not later than 14 days from the date of this advertisement appearing.

A. E. NEWELL, Secretary of the Board.
Temple of Peace and Health, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT MEDICAL OFFICER in Thoracic Medicine (Senior Hospital Medical Officer), Glan Ely Hospital, Fairwater, Cardiff (240 pulmonary and non-pulmonary beds). Previous experience in tuberculosis and chest diseases essential.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

DUBLIN. ST. VINCENT'S HOSPITAL. Applications for the post of HONORARY ASSISTANT SURGEON should be made on or before 15th February, 1956.

For further information please apply to the Hon. Secretary, Medical Board.

DUBLIN. NATIONAL MASS-RADIOGRAPHY ASSOCIATION, LIMITED, 37 39, Tara-street, DUBLIN. The Directors of the above Association invite applications from Radiologists, holding the D.M.R. or D.M.R.E. for the whole-time post of ASSISTANT MEDICAL DIRECTOR in Dublin. The appointment is tenable for 5 years. Salary £1400 p.a. Duties will include the interpretation of 70 mm. X-ray film.

Application forms may be obtained from the Secretary, 37/39, Tara-street, Dublin.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. UNIVERSITY OF CAPE TOWN. Joint Medical Staff for Groote Schuur and other teaching Hospitals. Vacancies.

Applications are invited from registered medical practitioners (registered specialists) for appointment to the following vacant posts at the Groote Schuur Hospital, Observatory, Cape Town :—

DEPARTMENT OF RADIODIAGNOSIS

MEDICAL PRACTITIONER (Grade F), with salary £1920 p.a. (fixed).

MEDICAL PRACTITIONER (Grade E), with salary £1800 p.a. (fixed).

MEDICAL PRACTITIONER (Grade D), with salary £1680 p.a. (fixed).

In addition to the basic salary, a cost-of-living allowance at rates prescribed from time to time by the Administration is payable to whole-time officials, at present amounting to £234 for married men and nil for single persons.

The leave and pension privileges and other conditions of service are governed by the relevant Ordinance and Regulations as well as the agreement entered into between the Provincial Administration of the Cape of Good Hope and the University of Cape Town.

The Joint Medical Staff is required to serve jointly the Provincial Administration and the University of Cape Town.

QUALIFICATIONS

Grades F and E.—Must have not less than 3 years experience after registration as specialists in Radiodiagnosis.

Grade D.—Must be a registered specialist in Radiodiagnosis.

The successful applicants will be required to submit satisfactory birth and health certificates and their appointments will be subject to the following conditions :—

(i) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(ii) Transport expenses (third class by rail oversea and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant and his family, if any, from place of residence to the place of assumption of duty in South Africa, will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(iii) Should the persons so appointed desire to reside permanently in this country on the expiration of their contract they will be offered permanent appointment during the term of contract but not earlier than 3 years or with effect from the conclusion of the contract, provided they have passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of this Province and provided further that their services and conduct during the period of contract are satisfactory and their state of health is such as will enable them to continue to discharge efficiently all the duties of the posts in which they will be employed.

Applications must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 309, South Africa House, Trafalgar-square, London, W.C.2.

The completed application forms, together with at least 2 recent testimonials, must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 9th March, 1956.

Candidates must state the earliest date on which they can assume duty.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. A vacancy will shortly occur for a SENIOR PATHOLOGIST at the Royal Perth Hospital. Salary £A2420 p.a. Conditions equivalent to State Public Service, including long service leave and provision for superannuation. The Royal Perth Hospital is a designated Medical Undergraduate Teaching Hospital ; it has more than 600 Beds and is extending. The vacant position is that of Senior Pathologist with responsibility for the Hospital's Service in Pathology under the general supervision of the Professor in Pathology, who is shortly to be appointed. The selected candidate may be required to undertake some medical undergraduate teaching, according to his qualifications and experience. A memorandum of further particulars concerning this position will be supplied upon request.

Applications must include particulars of qualifications, experience, age, marital status, and the names of 2 referees, and should reach the undersigned on or before 31st March, 1956.

JOSEPH GRIFFITH, Administrator.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. Applications are invited for the position of DIRECTOR OF RADIOLOGY at the Royal Perth Hospital. Candidates must be fully qualified Radiologists and preference will be given to those with higher qualifications. Salary £A2960 p.a. The Royal Perth Hospital is a designated Medical Undergraduate Teaching Hospital ; it has more than 600 Beds and is extending. The selected candidate may be required to undertake some medical undergraduate teaching, according to his qualifications and experience. A memorandum of further particulars concerning this position will be supplied on request.

Applications must include particulars of qualifications, experience, age, marital status, and the names of 2 referees, and should reach the undersigned on or before 31st March, 1956.

JOSEPH GRIFFITH, Administrator.

ETHIOPIA. PRINCESS TSAHAI MEMORIAL HOSPITAL, ADDIS ABABA, ETHIOPIA (ABYSSINIA). ANÆSTHETIST. Eth. $1260 per month (7 Eth. $ to the £) equals approximately £2055 p.a. income-tax free. Free accommodation and basic furniture. Excellent temperate climate, above malaria level. Satisfactory schooling to Matriculation standard.

Apply to Honorary Secretary, Princess Tsahai Memorial Hospital Council, 3, Charteris-road, Woodford Green, Essex.

Hospital Services : Junior Appointments

BROMPTON HOSPITAL, S.W.3. Applications are invited for the following posts :—

ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer grade). Appointment is for 6 months from 1st April, 1956. Experience in artificial pneumothorax essential and in E.N.T. work desirable. Duties include work in tuberculosis dispensary and wards.

NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st April, 1956. Duties include work in outpatient departments and wards, also 1 months duty at Frimley as occasion demands. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 4th February, to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of Orthopædic and Traumatic Specialist. Appointment for 6 months from 29th February.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 4th February, 1956.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of CASUALTY OFFICER AND DEPUTY RESIDENT SURGICAL OFFICER (graded as Senior House Officer), vacant 5th February, 1956. Recognised for F.R.C.S. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) HOUSE PHYSICIAN required for a period of 6 months. Post vacant 14th March, 1956.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered Women medical practitioners for the post of RESIDENT PATHOLOGIST. Salary in accordance with Ministry of Health scale for Senior House Officers. The appointment is for 6 months in the first instance. Duties to commence 1st April, 1956.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 8th February, 1956.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for M.R.C.O.G.). Duties to commence 1st April, 1956. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 8th February, 1956.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications from registered practitioners for the 6 months resident appointment of CASUALTY OFFICER AND E.N.T. HOUSE SURGEON (House Officer grade), should be sent immediately to Secretary, above address, quoting HH/CHO.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR required immediately in the Hammersmith Chest Clinic, Hammersmith Hospital. Previous experience of chest clinic and/or sanatorium or chest hospital practice desirable.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 4th February.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the post of SENIOR MEDICAL REGISTRAR at the above Hospital. Candidates should be registered medical practitioners and members of the Royal College of Physicians. The appointment is for 1 year in the first instant commencing 1st June, 1956.

Applications, together with names of 3 referees, to be sent to the Secretary by 17th February, 1956.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, London, N.21. HOUSE SURGEON required, duties mainly orthopædic, with some E.N.T., casualty, and emergency general surgery. New operating theatre. Outpatient and Casualty Departments. Preference given to applicants seeking pre-registration post under Medical Act, 1950.

Applications, with copies of 3 testimonials, to Hospital Secretary.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st April, 1956, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 21st February.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, E.1, AND THE NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR to the Department of Anæsthetics. Candidates must hold a higher qualification. The appointment will be for 1 year renewable for a maximum of 4 to be spent at the following hospitals :—

First year—The London Hospital.
Second year—Oldchurch Hospital.
Third year—St. Bartholomew's Hospital.
Fourth year—1 of above by arrangement.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 10th February, 1956.

London Hospital. H. BRIERLEY, House Governor.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity—110 Beds.) OBSTETRIC HOUSE SURGEONS required as under :—

(*a*) from 1st March (pre-registration) ;
(*b*) from 1st March (registered).

The 6-months appointments are recognised for the M.R.C.O.G.

Apply Group Secretary, Hackney Hospital, London, E.9, quoting MH/HO.

NEASDEN HOSPITAL, Brentfield-road, Neasden, N.W.10. Whole-time MEDICAL REGISTRAR (resident) required at Neasden Hospital (Infectious Diseases), for 1 year in the first instance, renewable. Experience in infectious diseases and children's diseases an advantage. Post vacant 26th April, 1956. The Hospital is a Regional Centre for poliomyelitis, and there are facilities for postgraduate studies. The Hospital may be visited by appointment with the Physician-Superintendent.

Application forms from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 6th February, 1956.

NEW END HOSPITAL, Hampstead, N.W.3. Registrar (general surgery) required for busy Surgical Unit of approximately 90 Beds. Experience of traumatic surgery and orthopædics desirable. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, 46, Cholmeley-park, N.6, by 7th February, 1956.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD AND BOARD OF GOVERNORS OF ST. BARTHOLOMEW'S HOSPITAL, E.C.1. SENIOR REGISTRAR in Psychiatry required under Joint Training Scheme. Appointment to commence 3rd April at Warley Hospital, Brentwood, Essex. (Resident or non-resident ; House available for married candidate.) Duties will include attendance at outpatient clinics. Subsequent period of service at St. Bartholomew's Hospital and associated Psychiatric Units. Appointment subject to annual review.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 11th February, 1956.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

SURGICAL REGISTRAR (resident), Victoria Hospital, Romford, Essex.

REGISTRAR in Obstetrics and Gynæcology (resident), Wanstead Hospital, Wanstead, E.11. Post recognised for D.Obst.R.C.O.G.

MEDICAL REGISTRAR (non-resident, sleeping in on duty nights), North Middlesex Hospital and Annexes, Silver-street, Edmonton, N.18. Duties may include teaching and an interest in endocrinology would be an advantage.

REGISTRAR in Diseases of the Chest (resident), Broomfield Hospital, near Chelmsford, Essex. Prepared to assist in major thoracic operations.

GERIATRIC REGISTRAR (resident—flat available for married applicant, furnished or unfurnished), Rochford General Hospital, Rochford, Essex. 120 Beds and outpatient clinic. Consultant-in-charge. Facilities for investigation, treatment and rehabilitation of acute and chronic sick.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 11th February, 1956.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. SENIOR MEDICAL REGISTRAR (transitional) (non-resident—sleeping in on duty nights), North Middlesex Hospital and Annexes, Silver-street, Edmonton, N.18. Candidates should have held post of Senior Registrar status. Duties include teaching and weekly session in neurological outpatients. Under present instructions tenable for 1 year only.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 11th February, 1956.

PUTNEY HOSPITAL, Lower Common, London, S.W.15. HOUSE SURGEON (resident), vacant 20th February, 1956. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 1st February, 1956.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. CASUALTY OFFICER (Senior House Officer grade). 6 months appointment starting 27th February. Non-resident. Recognised for F.R.C.S. 4 Casualty Officers employed ; duties include service with the 3 main Surgical Units.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and or names of 2 referees, to Secretary of Hospital, by 6th February.

REGIONAL NEUROSURGICAL CENTRE. (66 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery), vacant early February. Post recognised for F.R.C.S. and provides excellent opportunity for training in neurology.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ROYAL EYE HOSPITAL. King's College Hospital Group. Applications are invited for the post of SENIOR HOUSE OFFICER, vacant from 1st April, 1956.

Applications, together with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's-circus, S.E.1, as soon as possible.

ROYAL FREE HOSPITAL. Applications are invited for the post of FIRST ASSISTANT (Senior Registrar grade), to the Department of Cardiology at the Royal Free Hospital. Applicants must be registered general medical practitioners of not more than 10 years qualification, and have held a post as Senior Registrar in Medicine for a period of 4 years. Membership of the Royal College of Physicians is essential. The appointment is full-time, non-resident, and for 1 year in the first instance, duties to commence on 1st May, 1956. Salary and conditions of service in accordance with those laid down by the Ministry of Health.

Formal application, giving names of 3 referees, should be made to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, before 1st March, 1956.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON with care of gynæcological beds. Vacant 1st March, 1956. The appointment which is resident will be for a period of 6 months. Salary on National Health Service scale. Candidates will be required to attend for interview.

Applications, stating age and full particulars, to Secretary.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited for the appointment of HOUSE SURGEON. Recognised for F.R.C.S. and Pre-registration Service. Vacant on 5th March, 1956.

Applications, stating age and qualifications, should be sent to the Medical Superintendent, St. Andrew's Hospital, Bow, E.3.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for a post of SENIOR REGISTRAR in E.N.T. Surgery, tenable for 4 years, subject to annual re-election.

Applications, with the names of 3 referees, should be submitted to the undersigned within the next 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1, AND NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Gynæcology and Obstetrics, to be held for 4 years, as far as possible in equal parts at St. Bartholomew's Hospital and the North Middlesex Hospital, subject to annual re-election.

Applications, with the names of 3 referees, should be sent to the undersigned within the next 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT MEDICAL OFFICER in the grade of Senior House Officer, for duty at the Victoria Hospital for Children, Tite-street, S.W.3. Candidates for this post must have had resident hospital experience in the diseases of children. This post falls vacant on 22nd April, 1956, but the successful candidate will be required to take up duty on 1st April, 1956.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 11th February, 1956.

St. George's Hospital. P. H. CONSTABLE, House Governor.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Lisle-street, Leicester-square, London, W.C.2. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER for the Inpatient Department, vacant 1st April, 1956.

Inquiries and applications, with the names of 2 referees, by 11th February, 1956, to the Secretary to the Board of Governors.

ST. THOMAS'S HOSPITAL, London, S.E.1. Resident REGISTRAR to the Department of Anæsthetics, for a period of 1 year in the first instance from 22nd May, 1956.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 18th February, 1956.

ST. PETER'S, ST. PAUL'S AND ST. PHILIP'S HOS-PITALS. RESIDENT SURGICAL OFFICER (Senior Registrar grade) required for St. Peter's Hospital on 1st April, 1956. Applications invited from Male candidates on the British register who have completed their training in general surgery. Appointment for 6 months, with opportunity for a further 6 months if recommended. Candidates should be prepared to spend 1 year at the Hospital if required.

Applications (12 copies), with 12 copies of 3 recent testimonials, should reach the House Governor, St. Peter's Hospital, Henrietta-street, W.C.2, by 3rd March, 1956.

ST. TERESA'S MATERNITY HOSPITAL, The Downs, Wimbledon, S.W.20. (40 Beds.) Applications are invited for the appointment of RESIDENT OBSTETRIC HOUSE OFFICER for 6 months in the first instance, commencing on 13th February. Salary £425–£745 according to experience. Emoluments deducted according to usual scale. Self-contained flat available in Hospital grounds. This post is ideal for those studying for higher degrees.

Applications, stating age, qualifications, nationality, and experience to the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Female medical practitioners for the post of Full-time RESIDENT OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR, recognised for the M.R.C.O.G., which will become vacant on 24th April, 1956. The appointment is normally for 2 years, but subject to review at the end of the first year. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

For form of application apply (enclosing stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 11th February, 1956.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from registered medical Women for the post of SENIOR HOUSE OFFICER in Pathology. Previous experience in laboratory work is not essential. Applicants will be required to live near the Hospital.

For form of application apply to the Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a Whole-time ASSISTANT MEDICAL REGISTRAR (Registrar grade) in March, 1956.

Further particulars and form of application, which must be returned not later than 13th February, 1956, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required. Post vacant 12th March, 1956. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER in the E.N.T. and Ophthalmology Departments at above Hospital.

Application forms from the Hospital Secretary to be returned by 14th February, 1956.

ABERYSTWYTH GENERAL HOSPITAL. Mid-Wales HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital. Post recognised for F.R.C.S. Vacant on 31st January, 1956. The post is resident.

Applications, stating age, nationality, qualifications, and experience, accompanied by copies of 2 recent testimonials, should be sent to the Group Secretary, "Orlandon," 31, North-parade, Aberystwyth, within 14 days from the publication of this advertisement.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general medical and surgical duties. 6 months appointment, not suitable for pre-registration candidates.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE OFFICER (Male) for wards dealing with tuberculosis and diseases of the chest (56 Beds) and some outpatient work. Post vacant 14th March, 1956.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required to assist Consultant Geriatrician in a developing unit which serves the catchment area of the Hospital Management Committee, with main duties at Ashton-under-Lyne General Hospital. There is full scope for the study of clinical medicine and the post is suitable for a young Physician wishing to work for higher qualifications or interested in social medicine. Salary £775–£1075 p.a. by annual increments of £50.

Applications, together with 2 references, to the Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. HOUSE OFFICER (paediatrics) required at Ashton-under-Lyne General Hospital (36 paediatric beds). Recognised for D.C.H. Vacant mid-March.

Applications, with copies of 2 testimonials, to Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne.

AYLESBURY, BUCKINGHAMSHIRE. ROYAL BUCK-INGHAMSHIRE HOSPITAL. CASUALTY OFFICER (Senior House Officer) required 1st March. A flat is available at low rental.

Apply, with 2 copies of testimonials, to Secretary-Superintendent.

AYLESBURY, BUCKINGHAMSHIRE. TINDAL GEN-ERAL HOSPITAL. HOUSE SURGEON (Male or Female). Pre-registration post, but registered practitioners invited to apply. The post offers wide experience of general surgery with operative practice; recognised for F.R.C.S. Vacant 12th March, 1956. The acute Surgical Unit consists of 95 Beds. No casualty department.

Please apply, with 2 copies of 2 testimonials, to the Administrative Officer as soon as possible.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Pre-registration HOUSE SURGEON required immediately. The appointment offers exceptional opportunities for general experience in busy acute Surgical Unit.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BARKING HOSPITAL (Maternity), Upney-lane, Barking. There will be a vacancy for a RESIDENT SENIOR HOUSE OFFICER at the above Hospital on 13th February, 1956. Salary being £745 p.a., less emoluments. Applicants should have been qualified not less than 1 year. Duties will include antenatal work.

Applications, accompanied by copies of testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement. H. F. HARRIS, Secretary,

Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

BARROW-IN-FURNESS. NORTH LONSDALE HOS-PITAL. Applications are invited for a post of SENIOR HOUSE OFFICER (surgical) at the North Lonsdale Hospital, Barrow-in-Furness. Post recognised for F.R.C.S. National conditions and salary scale.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness.

BATH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT PATHOLOGIST at St. Martin's Hospital. The Officer's duties are mainly in the Area Blood Bank at that Hospital with duties at the Regional Blood Bank, Bristol, and at the Bath Central Laboratory. The post is graded Senior House Officer and will be vacant approximately 26th March, 1956.

Applications, stating age, qualifications and experience with names of 3 referees, should be forwarded to the Group Secretary, Manor Hospital, Combe Park, Bath, by 8th February, 1956.

BEVERLEY, YORKSHIRE. BROADGATE HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER. Progressive mental hospital of 600 Beds with outpatient clinics at general hospitals. Facilities for D.P.M. course at Leeds University. Single or married accommodation available. Candidates may visit Hospital by appointment with Physician-Superintendent.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorks.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory with attendance at Branch Laboratory, Driffield. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BIRMINGHAM. ALL SAINTS HOSPITAL. (1385 Beds.) Whole-time SENIOR REGISTRAR in Psychiatry. Candidates should be actively interested in research. Required to reside in Hospital when on duty. Married accommodation available. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with the arrangements for the interchange of Senior Registrars agreed by the 2 Boards.

Application forms from Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 13th February.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Dudley Road) Group, Birmingham, 18**

RESIDENT SURGICAL REGISTRAR for St. Chad's Hospital, Birmingham (50 general surgical beds). Recognised for F.R.C.S. Higher qualification an advantage. Limited married accommodation.

(2) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (ophthalmology), for Selly Oak Eye Little Bromwich General Hospitals. Recognised for D.O., F.R.C.S. Residential charge—£157 p.a.

(3) **No. 20 Group, Stoney Stanton-road, Coventry**

REGISTRAR (general medicine), for Coventry and Warwickshire Hospital (354 Beds). Resident. Experience specialty essential.

(4) **Mid-Worcestershire Group, Birmingham-road, Bromsgrove**

REGISTRAR (obstetrics/gynæcology). Duties in Mid-Worcestershire Group at Bromsgrove General Hospital (423 Beds) (7 notional half-days), and Dudley and Stourbridge Group (4 notional half-days).

(5) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (pathology) for City General Hospital (845 Beds). Resident, recognised for Dip. Path. Experience available in all branches of clinical pathology.

Application forms from Hospital Management Committee Secretaries, to be returned before 13th February, 1956.

BIRMINGHAM. RUBERY HILL HOSPITAL. (950 Beds.) Applications invited for post of REGISTRAR (Male or Female), resident or non-resident. Valuable experience provided in the investigation, diagnosis and treatment of all forms of psychiatric illness. Ministry of Health terms and conditions of service.

Applications, stating name, age, nationality, qualifications, experience, and providing the names of 3 referees, to be sent as soon as possible to the Group Secretary, Offices of the Group Hospital Management Committee, Rubery Hill Hospital, Birmingham.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. OBSTETRIC HOUSE SURGEON (pre-registration). Post vacant mid-February.

Applications, stating age, qualifications and names for reference, to Medical Superintendent.

BIRMINGHAM, 9. YARDLEY GREEN HOSPITAL. THORACIC SURGICAL UNIT. (66 Beds.) Vacancy for SENIOR HOUSE OFFICER. No previous experience in thoracic surgery necessary.

Applications, stating age, qualifications, training and experience, together with names of 2 referees, to be addressed to Group Secretary, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM ACCIDENT HOSPITAL, Birmingham, 15. (215 Beds.) RESIDENT HOUSE SURGEON, vacant 1st March. Recognised for F.R.C.S. Appointment for 6 months in General Accident Service and (at applicant's request) includes period in 32-Bedded Burns Unit.

Apply Administrator, naming 2 referees.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. Required, SENIOR HOUSE OFFICER or HOUSE OFFICER (including pre-registration), according to experience.

Detailed applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER (resident) required. Recognised for M.R.C.O.G. Department of Obstetrics and Gynæcology under control of Senior Consultant Obstetrician. Approximately 125 maternity beds, with 100 neonatal cots and 60 gynæcological beds. Vacant 1st March, 1956.

Applications, together with copies of 3 recent testimonials, to Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.) HOUSE OFFICER (surgical). Pre-registration post recognised for F.R.C.S. Modern well-equipped hospital with excellent facilities for gaining experience (92 general surgical beds).

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds.) RESIDENT HOUSE PHYSICIAN for the Department of Pædiatrics. Not available to pre-registration candidates. Tenable for 6 months. Hospital recognised for D.C.H.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOSTON. GENERAL HOSPITAL. (80 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (general surgery and E.N.T.) required with relief duties in the Casualty Department. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 6th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the immediate appointment of SENIOR HOUSE OFFICER (resident), orthopædics and casualty combined. The post is recognised for the F.R.C.S. examination and is normally tenable for 12 months.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH. ST. ANN'S HOSPITAL, Canford CLIFFS. (NEUROSIS HOSPITAL.) Whole-time JUNIOR HOSPITAL MEDICAL OFFICER required. St. Ann's is a 68-Bedded hospital for the treatment of psychiatric patients without legal formalities. A small flat suitable for 1 or 2 persons, is available if desired. Appointment will be for 3 years in the first instance.

Forms of application can be obtained from the Group Secretary, Group No. 52 Hospital Management Committee, Holloway Sanatorium, Virginia Water, Surrey.

BRISTOL. COSSHAM FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. Applications invited for the appointment of RESIDENT ANÆSTHETIST at Frenchay Hospital (513 staffed beds). The position offers experience in thoracic, plastic, neuro and general surgery. Vacant 1st March, 1956. The appointment will be made according to qualifications and experience in either the Senior House Officer or House Officer grade.

Applications, with particulars of age, qualifications and previous posts and the names of 2 referees, should be sent to the Group Secretary, Frenchay Hospital, by 4th February, 1956.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Vacancies on 1st February, 1956, for HOUSE SURGEONS in General Surgery at Cossham Memorial Hospital (88 Beds) and at Frenchay Hospital (513 Beds). Tenure 6 months. Recognised pre-registration posts but fully registered practitioners will also be considered. Appointments are recognised for F.R.C.S. examinations.

Apply to Group Secretary, Frenchay Hospital, Bristol, quoting qualifications, experience and names of 2 referees.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Southmead Hospital (571 Beds including 133 maternity) RESIDENT SENIOR HOUSE OFFICER (pathology). General experience in clinical pathology, including blood-transfusion duties, for 12 months commencing 1st February, 1956. (There is a possibility of a further year's appointment with basic training in morbid anatomy.)

Applications to be submitted to the Group Secretary, Southmead Hospital, Bristol.

BRIGHTON GENERAL HOSPITAL. House Physician (geriatrics). This is a large unit with an active rehabilitation section, providing excellent clinical facilities.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elmgrove, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. Casualty Medical OFFICER (for casualty and general duties). Post vacant 30th January, 1956. House Officer grade.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elmgrove, Brighton.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Vacancy for Locum REGISTRAR in Orthopædics for a period of about 2 months.

Further details may be obtained from the Secretary, Royal Sussex County Hospital, Eastern-road, Brighton (Phone: Brighton 29155).

BROMLEY HOSPITAL, Kent. Senior House Officer (in charge Casualty Department) required for 6 months from 1st March, 1956. Recognised for F.R.C.S. Deduction of £150 p.a. for residence.

Apply, stating age, qualifications with dates, previous experience, and naming 3 referees, to Administrative Officer.

BROMSGROVE, WORCESTERSHIRE. BARNSLEY HALL HOSPITAL FOR MENTAL AND NERVOUS DISEASES. (750 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Excellent opportunities for a young man to study in a modern mental hospital, modern treatments and up-to-date psychiatry. Residential quarters available for a single man. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health.

Applications, stating age and experience, together with the names of 3 referees, to the Medical Superintendent.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. (15 miles from Edinburgh.) Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Unit (32 Beds) at Bangour General Hospital, Broxburn, which is associated with the Ophthalmic Unit of the Royal Infirmary, Edinburgh. Salary and conditions of service will be in accordance with the regulations.

Applications, giving age, qualifications and particulars of previous experience, should be lodged with the Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian.

BUSHEY MATERNITY HOSPITAL, Bushey, Hertford-SHIRE. RESIDENT OBSTETRIC HOUSE SURGEON for above Hospital. Post vacant 13th March, 1956. 6 months appointment. Post recognised for pre-registration and D.Obst.R.C.O.G. purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director, Edgware General Hospital, Edgware, Middlesex, by 11th February, 1956.

BURY AND ROSSENDALE HOSPITAL MANAGE-MENT COMMITTEE. FAIRFIELD GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry). The appointment is for 1 year in the first instance, subject to renewal annually. Facilities will be granted to take the D.P.M. in Manchester.

Applications, with full details of age, qualifications and experience, together with names of 2 referees, should be submitted to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Non-RESIDENT RADIOTHERAPEUTIC REGISTRAR.

Apply, with full particulars and names of 3 referees, to Secretary by 20th February.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. House SURGEON for 6 months from 15th March. Recognised Pre-registration Service.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to the Secretary by 11th February. Interviews 20th February.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. Applica-tions are invited for the post of HOUSE PHYSICIAN for the 6 months commencing 1st February, 1956. Pre- or post-registration appointment.

Applications, stating age, qualifications, and any previous experience, together with the names of 2 referees, should be submitted as soon as possible to the Group Medical Superintendent, Law Hospital, Carluke.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (711 Beds.) SENIOR ANÆSTHETIC REGISTRAR. Candidates may visit Hospital by appointment.

Forms of application, returnable by 11th February, from Group Secretary at above address.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the resident post of CASUALTY OFFICER (Senior House Officer). It is recognised for the F.R.C.S. and offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off-duty time is generous and the post is one likely to suit both an officer seeking a higher qualification in surgery or one intending General Practice. The vacancy will occur on 17th March.

Apply Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, Chelmsford.

CHESTER ROYAL INFIRMARY. Applications are invited for the post of HOUSE SURGEON (general). Recognised for F.R.C.S. and Pre-registration Service.

Applications, giving full details together with the names and addresses of 2 referees, should be forwarded to the Group Secretary, XIII Chester and District Hospital Management Committee, 5, King's-buildings, Chester.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required from 1st February, 1956. Senior House Officer or House Officer (Intern) grade. Post recognised for F.R.C.S. and Pre-registration Service. Preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (404 Beds.) Applications are invited for the post of MEDICAL REGISTRAR now vacant. The Hospital may be visited by arrangement with the Physician-Superintendent.

Application forms can be obtained from, and should be returned by 10th February, 1956, to the Group Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Guildford-road, Chertsey, Surrey.

CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. Whole-time JUNIOR HOSPITAL MEDICAL OFFICER required for Whittington Hall, Chesterfield (372 female mentally deficient patients), and Scarsdale Hospital, Chesterfield. Salary scale £775–£50–£1075 p.a. Residential accommodation available for married officer at Dronfield Hospital.

Apply, giving names of 2 referees, to M. H. BOONE, Secretary, at Chesterfield Royal Hospital.

CHESTERFIELD ROYAL HOSPITAL. Senior House OFFICER required at above Hospital for Accident and Orthopædic Department. Post recognised for F.R.C.S. training and offers valuable experience. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. House Surgeon required immediately at above Hospital. Post recognised for Pre-registration Service and F.R.C.S. purposes. National salary and conditions.

Apply M. H. BOONE, Secretary.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Black Notley Hospital, Braintree (528 Beds)

HOUSE OFFICER (orthopædic surgery), first, second, third or pre-registration post ; tenable for 6 months. Recognised for F.R.C.S.

Posts of HOUSE SURGEON and HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and pædiatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester.

DERBY. CITY HOSPITAL. House Surgeon (pre-registration) or SENIOR HOUSE OFFICER (surgical), vacant 26th February. The post is recognised for the F.R.C.S.

Apply, stating full details with copies of 2 recent testimonials, to the Medical Superintendent as soon as possible.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (pre-registration) or SENIOR HOUSE OFFICER (gynæcology), vacant 1st February, 1956. Recognised for M.R.C.O.G.

Apply, stating full details with copies of 2 recent testimonials, to Hospital Secretary.

DONCASTER. WESTERN HOSPITAL. (178 Beds. Recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Post becomes vacant 5th April. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 6th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DORCHESTER. DORSET COUNTY HOSPITAL. (113 Beds.) HOUSE SURGEON required (Male or Female). Resident post, now vacant and tenable for 6 months. Recognised for F.R.C.S. examination and approved for Pre-registration Service.

Applications, stating age, experience and qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

DURHAM. COUNTY HOSPITAL. (120 Beds.) Pre-registration HOUSE SURGEON (orthopædics). The Hospital is the main Orthopædic and Accident Hospital for the area. Post vacant now.

Applications to Group Secretary, Dryburn Hospital, Durham.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT JUNIOR HOUSE OFFICER required for Thoracic Unit (Surgical), Eastern General Hospital, commencing 1st April, 1956. Salary scale £425–£525 p.a., less £125 p.a. for residential emoluments.

Applications, giving names of 2 referees, to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT ANÆSTHETIST (House Officer) required for Western General Hospital, commencing 1st February, 1956. Salary scale £425–£525 p.a., less £125 p.a. for residential emoluments. This post is recognised for the Diploma in Anæsthetics.

Applications, giving names of 2 referees, to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. RESIDENT JUNIOR HOUSE OFFICER required for Medical Chest Unit, Northern General Hospital, commencing 1st April, 1956. Salary scale £425–£525 p.a., less £125 p.a. for residential emoluments.

Applications, giving names of 2 referees, to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH. ASTLEY AINSLIE HOSPITAL. Astley AINSLIE, EDENHALL AND ASSOCIATED HOSPITALS. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, which affords excellent opportunities for the study of convalescence and rehabilitation. Experience in the specialty desirable.

Applications, giving full details, and the names and addresses of 3 referees, should be lodged on or before 18th February with the Secretary, Astley Ainslie Hospital, Grange Loan, Edinburgh.

EDINBURGH. CHALMERS HOSPITAL. Applications are invited from medical practitioners qualified at least 1 year, for the appointment of NON-RESIDENT SENIOR HOUSE OFFICER in General Surgery (with some E.N.T.). Appointment is for 1 year commencing 1st June, 1956, at National Health Service salary of £745 p.a.

Applications, with full particulars and names of 2 referees, should be sent to the Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9, within 14 days of this notice.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (651 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Anæsthetics. Regional Training Scheme includes facilities for gaining experience in specialist techniques at regional centres for plastic, thoracic and neuro surgery. Possession of F.F.A.R.C.S. desirable. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, by 7th February, 1956.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE PHYSICIAN for Thoracic and Dermatological Departments. Duties to include "taking of acute general medical cases." 6 months appointment. Post vacant 19th March, 1956.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 11th February, 1956.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) MEDICAL REGISTRAR, North Cambridgeshire and Clarkson Hospitals, Wisbech (271 Beds). Post provides experience in general medicine, pædiatrics, and geriatrics, also facilities for study. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, North Cambridgeshire Hospital, Wisbech.

(2) RADIOLOGICAL REGISTRAR, West Suffolk Group of hospitals. Main hospital, West Suffolk General, Bury St. Edmunds (285 Beds). Successful applicant will work directly under the Consultant Radiologist. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

Appointments for 1 year, renewable for second year.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 6th February, 1956.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 1st February, 1956. Pre-registration post. Recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary, at above address.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from pre-registration and registered medical practitioners for the appointments of HOUSE PHYSICIAN (2), vacant 26th March, 1956, and 6th April, 1956.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 4th February, 1956.

GLASGOW. BELVIDERE INFECTIOUS DISEASES HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER. Duties primarily in infectious diseases but may include work in tuberculosis.

Apply in writing, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE SURGEON (Male or Female) required. The post is a pre-registration post at a salary of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience with names of 2 referees, to Hospital Secretary.

GRIMSBY GENERAL HOSPITAL, Grimsby, Lincoln-SHIRE. Applications are invited for SENIOR HOUSE OFFICER for duties in E.N.T. and Ophthalmology Departments with some orthopædic duties. Up-to-date Medical Library and reading facilities available. Salary £745 p.a., less £150 p.a. for board and lodging.

Applications, with names of 2 referees, to Hospital Secretary.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. (General—629 Beds.) PÆDIATRIC HOUSE PHYSICIAN (resident) required. Duties include experience in general children's medical ward, Neonatal Unit and pædiatric out-patient clinics. Post recognised for D.C.H. and vacant early March. Pre-registration House Officers may also apply.

Applications, stating age, qualifications, nationality and experience with copies of not more than 3 recent testimonials, to Medical Director by 2nd February.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. (General—629 Beds.) HOUSE PHYSICIANS (resident) required. Appointments recognised for the M.D. (Lond.) Branch 1 and for pre-registration House Officers. Posts vacant end of March.

Applications, stating age, qualifications, nationality and experience, together with copies of not more than 3 recent testimonials, to Medical Director by 6th February.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general—first, second, or third post). To commence as soon as possible. Pre-registration post. Recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Paediatrician and Ophthalmic Consultant. Salary £745 p.a., less £130 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence 1st February, 1956.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. CASUALTY OFFICER (Junior Hospital Medical Officer) required.

Applications, stating 2 names for reference, should be sent to the Hospital Secretary.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident CASUALTY SENIOR HOUSE OFFICER for duty with the Accident Service and as Orthopædic House Surgeon, required for 6 months in the first instance on 1st February, 1956. Recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent immediately to the Medical Administrator, Lister Hospital, Hitchin.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) Applications are invited for the appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade), recognised for F.R.C.S. examination. Post vacant 15th February, 1956.

Applications, stating age, qualifications, experience, with copies of 3 recent testimonials or names for reference, to the Hospital Secretary.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds.) RESIDENT HOUSE SURGEON AND CASUALTY OFFICER required from 1st February, 1956. Post recognised for F.R.C.S., but not pre-registration.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer as soon as possible.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (Female) required to commence duty immediately. The post is recognised as a pre-registration appointment. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT JUNIOR HOUSE SURGEON (pre- or post-registration). Busy acute general Surgical Unit. Vacant now.

Applications, with 2 recent testimonials or names of 2 referees, to be sent to Hospital Secretary as soon as possible.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration post), resident, and tenable for 6 months, vacant mid-February.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE PHYSICIAN. Duties in an active Geriatric Unit for the investigation and treatment of acute and long-term illness. Resident post.

Applications, with full particulars, to the Hospital Secretary.

HALIFAX. ROYAL HALIFAX INFIRMARY. Senior HOUSE OFFICER in General Surgery required.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic) required. Post vacant 3rd March, 1956. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Pre-registration post, vacant 5th February, 1956. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE PHYSICIAN (resident) required, for paediatrics and general medical. Post vacant now. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ST. HELEN'S HOSPITAL. (493 Beds.) HOUSE SURGEON (resident) required. Pre-registration post, vacant now. National scale of salary.

Apply to Hospital Administrator immediately.

ILFORD MATERNITY HOSPITAL, Eastern-avenue, ILFORD. There will be a vacancy for a SENIOR HOUSE OFFICER (obstetrics and also entails care of some gynæcological beds) at the above Hospital on 1st March, 1956. Salary will be at the rate of £745 p.a., less emoluments. This post is recognised for training for the D.Obst.R.C.O.G.

Applicants should have been registered not less than 1 year and should send applications, accompanied by copies of 3 testimonials, to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

HASLEMERE AND DISTRICT HOSPITAL. (82 Beds.) GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of HOUSE OFFICER (Surgical with charge of 12 medical beds) for 6 months. Valuable experience in general and emergency surgery, orthopædic, E.N.T., gynæcological, children, and casualty work.

Apply immediately to Hospital Secretary, Haslemere, and District Hospital, Haslemere, Surrey.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

LEEDS. REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Medicine

(1) Regional Rheumatism Centre, Harrogate (240 Beds) (9 sessions) and the Rheumatism Clinic, General Infirmary at Leeds (2 sessions). Resident at the Royal Bath Hospital, Harrogate.

(2) Halifax Group (110 general medical beds) (380 geriatric beds). Duties divided equally between general medicine and geriatrics. Non-resident but single accommodation may be available.

General Surgery

(1) Hospitals in the York A Group (122 general surgical beds). Non-resident. If desired the duties may be altered to include a proportion of orthopædic surgery. Recognised for F.R.C.S. May include some duties in the Casualty Department.

(2) Clayton Hospital, Wakefield (75 general surgical beds). Duties are those of Resident Surgical Officer. Married quarters available. Recognised for F.R.C.S. May include some duties in the Casualty Department.

(3) Huddersfield Group (100 general surgical beds). Residential accommodation available. Duties mainly at Huddersfield Royal Infirmary. Recognised for F.R.C.S. May include some duties in the Casualty Department.

Geriatrics

Hull A Group (326 geriatric beds in charge of a Consultant Geriatrician). Duties include 3 sessions in general medicine. Non-resident.

Psychiatry

(1) Clifton Hospital, York (1100 Beds). Resident or non-resident.

(2) Menston Hospital, near Leeds (2500 Beds). Resident.

(3) Meanwood Park (Mental Deficiency) Hospital, Leeds (700 Beds). Accommodation available for single person.

If desired facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 9th February, 1956.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. SENIOR HOUSE OFFICER (resident) required for the Department of Neurosurgery. Post tenable for 6 months in the first instance. Terms and conditions of service of hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Secretary to the Board, by 9th February, 1956.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR required for the Department of Diagnostic Radiology. The post is open to candidates with or without D.M.R.(D.) qualification. Terms and conditions of service for hospital medical staff apply.

Applications, giving details of age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds 2, by 9th February, 1956.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. RESIDENT RADIOTHERAPY OFFICER (Senior House Officer status) required, for an initial period of 6 months from 1st April. The post is renewable for a further 6 months. Excellent training facilities available. Conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Secretary to the Board, by 13th February, 1956.

LINCOLN. HARMSTON HALL HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident) required for group of mental deficiency hospitals in Lincolnshire (943 Beds). Salary scale £775–£50–£1075 with national terms and conditions of service. Travelling expenses as approved. Furnished apartments charged at £160 p.a.

Applications, with full details of age, education, qualifications, previous appointments with dates, and 2 names for reference, to be sent to the Group Secretary, Harmston Hall, Lincoln, within 10 days.

LIVERPOOL (near). MOSS SIDE HOSPITAL, Maghull, near LIVERPOOL. (500 Beds for mental defectives exhibiting conduct disorders.) JUNIOR HOSPITAL MEDICAL OFFICER or REGISTRAR. Hospital recognised for D.P.M. training. Facilities for study at Liverpool University. House or quarters available.

Applications, naming 3 referees, to Medical Superintendent by 18th February, 1956. Candidates may visit Hospital by appointment.

LIVERPOOL, 18. MOSSLEY HILL HOSPITAL. (148 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately at above War Pensioners' Hospital. National Health Service terms and conditions.

Forms of application may be obtained from the Medical Superintendent.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of SENIOR HOUSE OFFICER in Obstetrics at the Liverpool Maternity Hospital for the period 1st April–30th September, 1956.

Apply by 9th February, 1956, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for a post of SENIOR REGISTRAR in Pædiatrics for the period 1st April–30th September, 1956. The successful candidate will be eligible to apply for reappointment for a further period. The duties of the appointment are at the Royal Liverpool Children's Hospital and the Alder Hey Children's Hospital.

Apply by 9th February on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LOUTH, LINCOLNSHIRE. COUNTY INFIRMARY. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (medical), now vacant, at this busy general hospital.

Applications, with full details, together with names of 2 referees, should be addressed to the Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL. (250 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required at above Hospital and associated units (134 Beds). Post vacant 1st March, 1956, and recognised for D.A. The Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 8th February, 1956.

LUTON, BEDFORDSHIRE. ST. MARY'S HOSPITAL. Locum SENIOR HOUSE OFFICER required for whole of March. The Hospital consists of 129 Beds for chronic sick and 33 Beds for chest diseases.

Applications to be sent to the Secretary, Luton and Hitchin Hospital Management Committee, at the above Hospital, as soon as possible.

LYMINGTON HOSPITAL, Lymington Hampshire. (95 Beds.) RESIDENT SENIOR HOUSE OFFICER (medical) required February.

Applications, with copies of testimonials, should be forwarded as soon as possible to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

MACCLESFIELD, CHESHIRE. PARKSIDE MENTAL HOSPITAL. PARKSIDE HOSPITAL MANAGEMENT COMMITTEE. MANCHESTER REGIONAL HOSPITAL BOARD. RESIDENT REGISTRAR in Psychiatry required at above Hospital. Married accommodation available.

Applications to be made to the Medical Superintendent, accompanied by 2 recent testimonials.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required at above Hospital. Hospital may be visited by direct appointment.

Application forms from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 11th February.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, which contains 330 Beds for the treatment of tuberculosis including major thoracic surgery. Candidates should have good experience in general medicine and in the treatment of pulmonary tuberculosis in adults. Appointment for 1 year in the first instance subject to renewal annually. Salary scale £775–£50–£1075 p.a.

Applications, stating age, qualifications, and experience, with relevant dates, together with names and addresses of 2 referees, to be sent to the Secretary of the Preston Hall Hospital Management Committee by 7th February, 1956.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), which will be vacant 12th March, 1956. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of ANÆSTHETIC REGISTRAR with duties in the South Manchester Group. This post is recognised by the Royal College of Surgeons for the F.F.A.R.C.S. and for the D.A.

Applications, stating age, qualifications, present post, experience and names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER post. Salary £745 p.a., less £155 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR. Whole-time post (non-resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications to be made on forms obtainable from the undersigned as soon as possible.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR REGISTRAR to a General Medical Unit, to commence as soon as possible. Whole-time, non-resident post, tenable for 12 months, renewable. Applicants must possess a higher qualification. Arrangements may eventually be made for the successful candidate to transfer to 1 of the Manchester Regional Hospitals to continue training.

Application to be made on form obtainable from the undersigned and to be returned not later than 11th February, 1956.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the E.N.T. Department, to commence as soon as possible.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 8th February, 1956.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to a General Medical Unit in which is housed the University Department of Neurology, to commence on 1st April, 1956. Whole-time, non-resident post, tenable for 12 months, renewable. Applicants should preferably possess a higher qualification.

Application to be made on form obtainable from the undersigned, to be returned not later than 8th February, 1956.

G. H. TAYLOR, Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) 1 HOUSE OFFICER (general surgery) required, pre-registration. Post recognised for F.R.C.S. examination. Post vacant end January.

Forms from Secretary.

MARKET DRAYTON (near), SHROPSHIRE. CHESHIRE JOINT SANATORIUM. (305 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER required. Applicants with less than 2 years experience considered, in the grade of Senior House Officer, Resident.

Detailed applications to Medical Superintendent at the Sanatorium.

MIDDLESBROUGH. WEST LANE HOSPITAL. (Infectious Diseases—229 Beds.) Applications are invited for the appointment of RESIDENT MEDICAL OFFICER for a period to be agreed. Salary appropriate to grade of Junior Hospital Medical Officer, viz., £775–£50–£1075 p.a.

Applications, stating age, nationality, qualifications, previous experience, and names of 3 referees, to be sent immediately to the Physician-Superintendent at the above Hospital.

MIDHURST, SUSSEX. KING EDWARD VII SANATORIUM. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER. Candidates should have had at least 6 months experience of tuberculous and non-tuberculous chest diseases. Commencing salary £600 p.a. in addition to full residential emoluments. The post is superannuable.

Applications, stating age, qualifications, experience, and the names of 3 referees, should be sent to the Medical Superintendent and marked "A."

NEWRY, Co. DOWN, N. IRELAND. DAISY HILL HOSPITAL. HOUSE SURGEONS (pre-registration) wanted. Appointments will be for a period of 12 months. Salary will be at rate £425 p.a. (less charge of £125 for board and lodging) on first appointment. Terms and conditions of employment will be as laid down by N.I. Hospitals Authority.

Applications, stating age, qualifications, &c., should be addressed to PETER J. LOY, Secretary.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) CHEST UNIT. (52 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for Chest Unit (mainly treatment of pulmonary tuberculosis). Associated Chest Clinic and Mass Miniature Radiographic Unit. Resident or non-resident, vacant 1st April, 1956. In appropriate cases there are facilities for attending the D.P.H. Course in the University of Durham.

Applications, together with copies of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Department of Urology—51 Beds). The department is a self-contained unit and the Regional Urological Centre. Post vacant 1st April, 1956. Post offers excellent opportunities for gaining practical experience in urology, and is recognised for the F.R.C.S. (Eng.).

Applications, together with 1 copy of 2 recent testimonials, should be addressed to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE REGIONAL HOSPITAL BOARD. Gateshead AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR PHYSICIAN (whole-time), resident at Bensham General Hospital (386 Beds). Married or single accommodation available.

Applications, with names and addresses of 3 referees, to Deputy Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle, 6, within 14 days.

NOTTINGHAM (near). SAXONDALE HOSPITAL, RADCLIFFE-ON-TRENT, near NOTTINGHAM. (930 Beds—Recognised for D.P.M. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR in Psychiatry required. Single accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 6th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER to the Department of Obstetrics and Gynæcology. The appointment is for 1 year, and will be subject to the terms and conditions of service of hospital medical staff. The salary will be at the rate of £745 p.a., subject to the appropriate deductions.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Queen Victoria-road, Newcastle-upon Tyne.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty); duties to commence 15th March. Establishment 3. Recognised for F.R.C.S. Post offers wide experience of casualty work.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident HOUSE PHYSICIAN (pre-registration—first or second post), required 11th February for 6 months.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

ORPINGTON HOSPITAL, Orpington, Kent. Resident ANÆSTHETIST (Senior House Officer), Male, required. General Hospital—813 Beds. Post recognised for D.A.

Apply Physician-Superintendent.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of Trainee RESIDENT SENIOR HOUSE OFFICER to Oxford Eye Hospital (52 Beds) with effect from 1st March, 1956. The successful candidate will, if found suitable, be appointed resident Senior House Officer for 6 months from 1st October, 1956, at the Royal Berkshire Hospital (Ophthalmic Department) and a further 6 months as Senior Resident Officer at Oxford Eye Hospital at a salary of £850 p.a. Applicants must have had previous experience in ophthalmology. The post is recognised for the F.R.C.S. examination in Ophthalmics.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 6th February, 1956.

OXFORD. UNIVERSITY OF OXFORD. UNITED OXFORD HOSPITALS. SENIOR REGISTRAR in General Surgery to the Radcliffe Infirmary. Non-resident. Applicants must hold an F.R.C.S. or M.S. Diploma. A scheme for providing experience in a non-teaching hospital of the Oxford Regional Hospital Board is available if mutually agreed.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 16th February, 1956.

PERTH. COUNTY AND CITY OF PERTH GENERAL HOSPITALS. Applications are invited for the following posts :—

1 HOUSE SURGEON and 1 SENIOR HOUSE SURGEON (Fracture and Orthopædic Unit), Bridge of Earn Hospital.

1 HOUSE SURGEON (Casualty Department), Perth Royal Infirmary.

Junior posts are recognised for Pre-registration Hospital Service. All posts are recognised by the Royal College of Surgeons under regulations for the F.R.C.S.

Applications, giving age, qualifications, experience, and names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for M.R.C.O.G., D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A. R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical), to include duties at Porth and District Hospital.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's base Hospital serving population of 174,000. Recognised for M.R.C.O.G., D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (obstetrics and gynæcology).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd, as soon as possible.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Saint Mary's Hospital (130 surgical beds)
HOUSE SURGEONS (3) (pre-registration), vacant now.

Saint Mary's Hospital (74 acute medical beds)
HOUSE PHYSICIANS (pre-registration), vacant 31st January, 24th February.

Queen Alexandra Hospital (78 acute medical beds)
HOUSE PHYSICIAN (pre-registration) vacant 1st February, 1956.

Royal Portsmouth Hospital (Orthopædic Department—104 Beds)
HOUSE OFFICER (pre-registration), vacant now.

Royal Portsmouth Hospital (70 surgical beds)
HOUSE SURGEON (pre-registration), vacant 1st February.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.
35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of ANÆSTHETIC SENIOR REGISTRAR in the Portsmouth Group, vacant on 16th April, 1956. 5 Consultant Anæsthetists practise in the Group. This post offers experience in most branches of anæsthesia and entails a wide range of duties, including the Poliomyelitis Unit.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him, duly completed, on or before 6th February, 1956. Canvassing will disqualify. Candidates may visit the hospitals by arrangement with the Secretary of the Group.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RADIOLOGICAL REGISTRAR (diagnostic) to the Portsmouth Group of hospitals, vacant now. A Diploma in Diagnostic Radiology would be an advantage but candidates working for it would be considered. The post is recognised for the D.M.R.D.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him, duly completed, on or before 6th February, 1956. Candidates may visit the above Group by arrangement with the Group Secretary.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road. SENIOR HOUSE OFFICER in Anæsthetics, vacant 1st April, 1956, recognised for the D.A. and Fellowship. The appointment will be for a period of 12 months.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

READING. ROYAL BERKSHIRE HOSPITAL. (405 Beds.) Applications are invited from registered or provisionally registered medical practitioners, Male or Female, for post of RESIDENT HOUSE SURGEON (general surgery), vacant 21st February, 1956, for period of 6 months. Salary £425–£525 p.a., less £125 board-residence.

Write, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (405 Beds.) Applications are invited from registered and provisionally registered medical practitioners, Male or Female, for post of RESIDENT HOUSE SURGEON (E.N.T.), vacant 21st February, 1956, for period of 6 months. Salary £425–£525 p.a., less £125 board-residence.

Write, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (401 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the resident post of HOUSE SURGEON (gynæcology) vacant 1st February, 1956, and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, and present post, with copy of 1 recent testimonial, to Secretary.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL. HOUSE SURGEON. Pre-registration post with opportunity to proceed to House Physician after 6 months. Recognised for F.R.C.S. Vacant 5th March, 1956.

Apply to the Group Secretary, Redhill Hospital Management Committee, Earlswood Mount, Redhill, Surrey (Redhill 3581—Ext. 20).

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery) required from 13th February, 1956. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent, stating also names of 2 referees.

ROTHERHAM CLINICAL LABORATORY, Moorgate GENERAL HOSPITAL, ROTHERHAM. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (pathology) required with duties at associated clinical laboratories within the area of the Rotherham and Mexborough Hospital Management Committee. Post becomes vacant 8th April. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 6th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum ANÆSTHETIC REGISTRAR required from 3rd to 13th February.

Applications, together with names of 2 referees, to Hospital Secretary.

SOUTHAMPTON GROUP OF HOSPITALS. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR to the Geriatric Department of the above Group. The department is in the charge of a Consultant Physician and consists of an Admission Unit of 55 Beds in the Southampton General Hospital and 310 long-stay beds in other hospitals in the Group. There is a close link with the Local Authority, and order of priority for admission to Hospital is assessed by an initial domiciliary visit. Post offers opportunity to work for higher degrees. A flat (unmarried quarters) is available in 1 of the hospitals if required.

Forms of application, which may be obtained from the undersigned, should be returned not later than Wednesday, 8th February, 1956.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER/SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds) in February. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. The Hospital is the centre to which all trauma from a large industrial town and port is directed thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SCOTLAND. NORTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in the Regional Orthopædic Unit. Candidates should have experience in Orthopædic Surgery and preferably should hold an appropriate higher qualification.

Applications, giving 2 names for reference, should be submitted by 14th February, 1956, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Orthopædic Surgery. The main duties are at Raigmore Hospital, Inverness.

Schedules of application and further particulars are obtainable from the undersigned, with whom applications should be lodged by 6th February, 1956. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Anæsthetics. Duties mainly at the Royal Northern Infirmary and Raigmore Hospital, Inverness.

Forms of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by 13th February, 1956. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for a Whole-time RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER post at Culduthel Hospital, Inverness (102 Beds—tuberculosis and infectious diseases). Appointment to be held for 1 year, but may be extended for a second year. Accommodation is available for a married officer.

Further particulars and schedules of application, which are obtainable from the undersigned, should be lodged by 6th February, 1956. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at Western District Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment and naming 3 referees, to be lodged with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3, by 3rd February, 1956.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Radiodiagnosis at the Royal Infirmary of Edinburgh. The work will include periods of duty at other hospitals in the region. The present holder of the post on a locum basis is eligible to apply.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 25th February, 1956.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant 2nd March, 1956. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Assistant Resident Surgical Officer), general and orthopædics, vacant 12th March, 1956. The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKTON-ON-TEES. THE CHILDREN'S HOSPITAL, Durham-road. (84 Beds.) CLEVELAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER. Salary and conditions of service in accordance with Ministry of Health regulations.

Applications, with copies of 2 recent testimonials, to be forwarded to the Group Secretary, West Lane Hospital, Middlesbrough, immediately.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) Immediate vacancy for RESIDENT HOUSE SURGEON (Senior House Officer).

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Psychiatry required for Middlewood Hospital, Sheffield (2098 Beds). D.P.M. essential. House available. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in the special branches of psychiatry available in the Hospital area.

Application forms and further details obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 6th February.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. REGISTRAR in Psychiatry required, to work under the newly appointed Consultant Psychiatrist and Professor of Psychiatry. The new department is opening with a small Inpatient Unit of 8 Beds at the Royal Infirmary, prior to further expansion in the near future by the addition of a larger self-contained unit specially adapted for the purpose. There will be opportunities for postgraduate training and research. Appointment to commence 1st July.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 25th February, 1956, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, from whom further particulars may be obtained.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for :—

(*a*) REGISTRAR to the Department of Radiology at the Royal Infirmary Royal Hospital Units.

Applications, with the names of 3 referees, to be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

(*b*) RESIDENT PATHOLOGIST (Senior House Officer) required from 1st April at the Jessop Hospital for Women. The appointment forms part of a training scheme for candidates for the M.R.C.O.G. examination. If eligible, the holder will be able to apply for transfer to a clinical appointment in the Hospital in due course.

Applications, with 3 recent testimonials, to be sent at once to the Superintendent, Jessop Hospital for Women, Leavygreave-road, Sheffield, 3.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. Sidcup AND SWANLEY HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (anæsthetics) required to commence duty on 20th February, 1956. Salary £745 p.a., less £150 p.a. for residential emoluments. The post is recognised for the F.F.A.R.C.S. and D.A.

Applications, stating nationality, age, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Tuberculosis Service) required for duties at the Moor Park and Hadrian Hospitals. Junior Hospital Medical Officer or Senior House Officer grade according to experience.

Applications, with names of 2 referees, to Group Secretary, Preston Hospital, North Shields.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following pre-registration appointments.

Tynemouth Victoria Jubilee Infirmary
1 HOUSE SURGEON.
Preston Hospital
1 HOUSE SURGEON.

Applications to Group Secretary, Preston Hospital, North Shields.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens ANÆSTHETIC REGISTRAR (resident), required at the above Hospital for period 3rd–31st March, 1956, inclusive. Recognised for D.A.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds.) RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer status) required. Male or Female.

Applications, stating age, previous experience, and copies of 2 recent testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

SUNDERLAND. ROYAL INFIRMARY. (300 Beds.) HOUSE OFFICER (Male) required immediately for duties in Gynæcological and Urological Units. Provisionally registered practitioners may apply.

Applications, naming 2 referees, to the Hospital Secretary, Royal Infirmary, Sunderland.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (pædiatrics) required. Post vacant 14th February. Pre-registration. Hospital recognised for D.C.H.

Detailed applications, with copy testimonials, to Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (orthopædics) required. Recognised pre-registration, vacant now.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Post vacant early February. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general medicine with dermatology) required. Post vacant 31st January—pre-registration.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (medical—dermatology) required. Recognised pre-registration.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required; pre-registration post.

Applications, stating age, qualifications with dates, with copies of 2 testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for the Unit of Obstetrics and Gynæcology. Post recognised for M.R.C.O.G. Preference given to candidates seeking pre-registration post.

Applications, stating age, experience and qualifications, with copies of 2 testimonials, to Hospital Secretary.

WARWICK (near). CENTRAL MENTAL HOSPITAL. (1400 Beds.) SENIOR HOUSE OFFICER required. Neurosis Unit. Adult and child psychiatry clinics, Departments of Electroencephalography, Occupational Therapy, Psychology, and Social Work. Recognised for D.P.M. Married or single quarters. Salary £745 p.a.

Applications, with names and addresses of 3 referees, to Medical Superintendent within 14 days of appearance of this advertisement.

WATFORD. GROUP 9 PATHOLOGICAL LABORATORY. NON-RESIDENT PATHOLOGIST (Senior House Officer grade) required. The appointment is tenable for 1 year in the first instance. Salary and conditions according to National Health Service regulations.

Applications to Consultant Morbid Anatomist, Group 9 Laboratory, 6, Rickmansworth-road, Watford, Herts.

WATFORD, HERTFORDSHIRE. THE PEACE MEMORIAL HOSPITAL. (198 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the new Casualty and Outpatient Department of the above Hospital. The post is recognised for F.R.C.S. examination. Salary according to the National Health Service scale.

Applications, with copies of 2 recent testimonials, to the Administrator.

WATFORD MATERNITY HOSPITAL, King-street, WATFORD. (58 Beds.) Applications are invited for the residential post of SENIOR OBSTETRICS OFFICER for duties commencing 18th March, 1956. Salary £745 p.a., less £155 p.a. for residential emoluments. Hospital recognised for M.R.C.O.G. examination.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible after the appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR in Psychiatry, Whitchurch Hospital, Cardiff (876 Beds). Single accommodation available.

REGISTRAR in Pædiatrics, based Royal Gwent Hospital, Newport, may also be required to visit other hospitals in Newport and East Monmouthshire Hospital Management Committee area. Recognised D.C.H. Non-resident.

REGISTRAR (general surgery). To serve Newport and East Mon. Hospital Management Committee. Based at Royal Gwent Hospital, Newport (260 Beds). Non-resident.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT GENERAL HOS-PITAL. (144 Beds.) HOUSE SURGEON, vacant immediately. Pre-registration.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WEYMOUTH AND DISTRICT HOSPITAL. (124 Beds.) HOUSE SURGEON (Male or Female) required. Resident post, now vacant and tenable for 6 months. Recognised for F.R.C.S. examination, and approved for Pre-registration Service.

Applications, stating age, qualifications, and nationality, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset, immediately.

WINDSOR GROUP OF HOSPITALS. Senior House OFFICER required for Plastic Surgery based on King Edward VII Hospital, Windsor. Post vacant 1st April. Duties include care of hand injuries and accidents requiring plastic surgery. Plastic and accident services are closely associated and successful candidate will be given opportunity of gaining experience in general trauma.

Applications stating age, nationality, qualifications with dates, and experience with copies of 3 testimonials, to Hospital Secretary, by 5th February.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR (Registrar grade), resident or non-resident, for Orthopædic Unit of the Group. Post vacant 7th March, 1956. The Group is served by orthopædic team covering Winchester, Southampton, Salisbury and Isle of Wight areas. A wide variety of experience in orthopædic conditions is available.

Forms of application obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester, should be completed and returned not later than 15th February, 1956.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant early February.

Applications, with copies of 2 testimonials, to the Secretary.

WORKINGTON INFIRMARY, Cumberland. (118 Beds. Pre-registration post, recognised F.R.C.S.(Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post), vacant 1st February.

Detailed applications, with dates, and names of 2 referees, to Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st February, 1956. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. WAR MEMORIAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence duties on 1st February, 1956. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

DUBLIN. JERVIS STREET HOSPITAL. The Managing Committee of the Hospital invite applications from qualified practitioners for the positions of :—

SURGICAL REGISTRAR.

MEDICAL REGISTRAR.

Each candidate shall with his application state his age, and furnish particulars of his medical and surgical qualifications and experience. The appointment will be for 1 year but may be extended for a second and a third consecutive year. Commencing salary £350 p.a.–£100–£450 p.a.–£100–£550 p.a. Suitably qualified candidates may commence at a salary above £350 p.a. The appointee will reside in the Hospital and have full board.

Applications addressed to the undersigned should reach the Hospital before NOON on Wednesday, 29th February, 1956.

By Order, SHEILA O'DEA, Secretary.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in General Surgery at hospitals managed by the North Armagh Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 11th February, 1956.

U.S.A. BETHESDA HOSPITAL, Cincinnati 6, Ohio, U.S.A. ROTATING INTERNS—12 months; fully approved hospital for Intern and Resident Training, broad Teaching Programme, desires applications from graduate medical doctors. Liberal stipend, meals and room furnished.

Please apply to the Superintendent, giving details in full, first letter.

U.S.A. CAMBRIDGE, MASSACHUSETTS. Applications are invited for the positions of approved RESIDENCIES in Anæsthesia for a 2-year period beginning 1st July, and 1st September, 1956. Salary $1800 first year and $3600 second year, and full maintenance. Training in all branches of anæsthesia. There is affiliation with other hospitals. •Opportunity to attend various meetings in anæsthesiology throughout the New England Area.

Applications, stating age, nationality, qualifications, and experience, together with the names of their referees, should be forwarded to the Director of Anæsthesiology, P.O. Box 39, Cambridge 38, Massachusetts. Travelling expenses to and from the U.S.A. will be paid, but particulars will be sent as soon as application is received. Please enclose recent photograph with application.

Public Appointments

CROYDON. COUNTY BOROUGH OF CROYDON. ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Applications are invited for this established appointment from registered medical practitioners, with at least 3 years experience after qualification, for duties mainly in the School Health and Maternity and Child Welfare Services. The D.P.H. or D.C.H. will be an advantage. Salary within the scale £975–£50–£1375 p.a., commencing according to experience.

Application forms (from the Medical Officer of Health, 45, Wellesley-road, Croydon) must be returned to him by 20th February, 1956. E. TABERNER, Town Clerk.

CUMBERLAND COUNTY COUNCIL. Applications are invited for the appointment of DEPUTY COUNTY MEDICAL OFFICER. Possession of the D.P.H. or corresponding qualification is essential. Experience in public health administration, and in mental deficiency, will be a recommendation. Salary within the range £1475 (by 2 annual increments of £100 and 1 of £52 10s.) to a maximum of £1727 10s., according to qualifications and experience. The successful applicant will be required to pass a medical examination and to contribute to the appropriate superannuation scheme.

Further particulars may be obtained from the County Medical Officer, 11, Portland-square, Carlisle, to whom applications, together with the names and addresses of 3 referees, must be sent by Monday, 20th February, 1956.

G. N. C. SWIFT, Clerk of the County Council.

The Courts, Carlisle, 11th January, 1956.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
STAINDROP ..	DURHAM ..	11TH FEBRUARY, 1956
CLEVEDON ..	SOMERSET ..	11TH FEBRUARY, 1956
DEWSBURY ..	YORK	11TH FEBRUARY, 1956
LEATHERHEAD ..	SURREY ..	11TH FEBRUARY, 1956

GAMBIA MEDICAL DEPARTMENT. Medical Officer (leprosy) is required in the Gambia to be in charge of a leprosy project sponsored by the World Health Organisation/United Nations International Children's Emergency Fund, for the control and treatment of leprosy, and to supervise leprosy treatment centres. Experience in leprosy is not essential but would be an advantage. The officer selected will be offered a World Health Organisation travelling fellowship soon after appointment. Candidates must possess medical qualifications registrable in the United Kingdom.

Appointment may be as follows :—

(*a*) On short-term contract (2 tours each of 18–24 months duration) with inclusive salary of from £1098, rising to £2004 a year ; after completion of contract a gratuity (taxable) is paid at the rate of £37 10s. for each completed period of 3 months (including leave).

(*b*) From the National Health Service. Candidates may leave the National Health Service but retain their superannuation rights and receive a gratuity (taxable) of 20% of the aggregate of their salary. Inclusive salary of candidates so appointed is in the scale £942–£1860 a year.

Starting salary in both cases depends upon qualifications and experience.

Quarters provided at low rental. Free passages in both directions for Officer, wife, and up to 2 children under 18 years of age. Local leave is permissible and generous home leave is granted after each tour.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/12/07).

HER MAJESTY'S OVERSEA SERVICE. Medical BRANCH—KENYA. SCHOOL MEDICAL OFFICER (Male or Female) required in the Medical Department of Kenya to supervise the Public Health aspects of European, Asian, and African schools with particular reference to health, education, and nutrition together with a certain amount of clinical examination. Candidates must possess a medical qualification registrable in the United Kingdom ; a Diploma in Public Health would be an advantage. Appointment can be made on a permanent basis with pension (non-contributory) at age of 55, or on short-term contract with gratuity (taxable) payable on satisfactory completion of service. Salary ranges from £1116 to £1836 a year ; starting-point is determined by experience and 4 extra increments are given to a candidate possessing the D.P.H. or other approved higher qualification. Temporary cost-of-living allowance at the rate of 10% of salary is also payable, subject to a maximum of £162 a year, making gross emoluments of £1228–£1998 a year. Quarters are generally available at rental of 10% of salary. Free passages in both directions for officer and wife and up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave granted after each tour of from 40 to 48 months. Educational facilities are available.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/7/02).

LEWISHAM CREMATORIUM. Applications are invited from local medical practitioners of not less than 5 years standing for nomination as DEPUTY MEDICAL REFEREE of Lewisham Crematorium. Applicants must possess such experience and qualifications as will fit them for the discharge of the duties required by the Cremation Regulations 1930 and 1952. The remuneration will be on the basis of 10s. 6d. per certificate and the nomination will be for a period of 1 year.

Applications should be in the hands of the undersigned by not later than 6th February, 1956.

ALAN MILNER SMITH,
Town Clerk and Registrar of the Lewisham Crematorium.
Lewisham Town Hall, Catford, S.E.6.

NOTTINGHAMSHIRE COUNTY COUNCIL. Hucknall URBAN DISTRICT COUNCIL. Mixed appointment. Applications are invited from registered medical practitioners for the mixed whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND MEDICAL OFFICER OF HEALTH to the Hucknall Urban District. Applicants must have had at least 3 years professional experience since qualifying, be experienced in the duties of Medical Officer of Health, School Medical Officer, and the care of mothers and young children, and possess a Diploma in Public Health.

Salaries are in accordance with awards 2285, 2321, 2452, and 2565 of the Industrial Court for Public Health Medical Officers holding mixed appointments, namely :—

(*a*) Assistant County Medical Officers (32/44ths) £894 17s. 9d.–£39 15s. 5d.–£1093 13s. 0d. (on scale £1125–£50–£1375, plus loading in accordance with Spens Formula).

(*b*) Medical Officer of Health (12/44ths) £484 8s. 8d.–£14 6s. 4d.–£541 14s. 0d. (on scale £1676 5s. 0d.–£52 10s. 0d.–£1886 5s. 0d., plus 12/44ths of £100).

Application forms and conditions of appointment are obtainable from my office and applications should reach me by 18th February, 1956. Canvassing disqualifies.

A. R. DAVIS, Clerk of the County Council.
Shire Hall, Nottingham.

GOVERNMENT OF THE LEEWARD ISLANDS. Physician SPECIALIST possessing M.R.C.P. is required for the Cunningham Hospital, St. Kitts-Nevis, Leeward Islands, to have charge of all medical inpatients and to advise on the care of medical outpatients referred by medical practitioners. Appointment would be on agreement for 3 years in the first instance. Salary is at the rate of £1600 a year and the officer would be permitted to accept fees for consulting practice. Income-tax at local rates. Unfurnished quarters are provided at a rental not exceeding £150 a year. Free passages, including rail fares to port of embarkation, provided for Officer, wife, and children under the age of 18, not exceeding 5 persons in all.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/33/09).

SUDAN GOVERNMENT. The Ministry of Health, Sudan Government, invites applications for the following posts :—

MEDICAL PATHOLOGIST. Candidates must have Honours Degree and be fully literate in either Arabic or English. Age 22–45 years. Salary range from £E.1750 to £E.2330 p.a. (for Junior Specialist) or a fixed salary of £E.2500 p.a. (for Specialist).

BACTERIOLOGIST. Candidates should have specialist experience in bacteriology, and in a reputed Institute. Salary range from £E.1750 to £E.2330 p.a. (for Junior Specialist) or a fixed salary of £E.2500 p.a. (for Specialist).

Candidates for these posts may apply for secondment from the National Health Service for a period of up to 3 years under the terms of circular letter No. NHB/(52) 106EG/(52)101 of 30th September, 1952.

The above appointments will be on short-term contracts for a period of up to 3 years and starting rates of pay will be determined according to age, experience and qualifications. In certain cases a cost-of-living allowance is also payable at present. A bonus of 1 months salary for each year of service, subject to a maximum of 6 months pay is payable on satisfactory completion of the contract. Outfit allowance of £E.50 is payable when the contract is signed. Free passage on appointment. Annual leave after the first tour.

Further particulars and application form will be sent on application to Dr. E. P. PRATT, Consulting-Physician to the Sudan Government, 137, Harley-street, London, W.1. Please quote the appointment concerned and give name and address in block letters.

General Practice

For an Executive Council post (England and Wales) apply on form **E.C.16A** *obtainable from the council. Mark envelope "Vacancy."*

TOTTENHAM. Applications invited for Vacancy. List at present approximately 1150. "Intermediate" area. Premises will be available. Apply on Form E.C.16A before 4th February, 1956, to the Clerk, Middlesex Executive Council, Gloucester House, Gloucester-gate, London, N.W.1.

Hospital Services : Non-Medical Appointments

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. BIOCHEMIST required, preferably having Honours B.Sc. Basic grade. Salary and conditions in accordance with Whitley Council recommendations.

Detailed applications to Secretary.

Miscellaneous

To non-professional posts the Notification of Vacancies Order **1952** *applies*

Marks and Spencer Limited invite applications for the post of Senior Assistant (Female) eventually to become Deputy to the Chief Medical Officer. The additional qualification of D.P.H. or D.I.H. is desirable, but not essential. Salary according to B.M.A. scale.—Applications by letter stating age, qualifications with dates, and experience, to the Secretary, Medical Selection Committee, Marks and Spencer Limited, 82, Baker-street, London, W.1.

Partner wanted for busy general practice, Jersey, C.I.—Apply, stating age, qualifications, and experience : GARDNER, Five Oaks, Jersey, C.I.

Medical Publisher requires experienced Secretary from 2 to 5.30 P.M. Monday–Friday.—Phone : LANgham 4255.

Kensington, elegantly furnished ground-floor consulting-room, waiting-room, cloakroom h. and c. available for Medical Consultant.—Address, No. 199, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

H. A. Saunders Limited, Golders Green, for your Austin. Limited number of deliveries now available to proven essential users, new or used.—Brochures and application forms free, Austin House, 140–144, Golders Green-road, Golders Green, London, N.W.11 (SPEedwell 0011—10 lines).

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